

American Aviation

MANAGEMENT
ENGINEERING
PRODUCTION
OPERATIONS
MAINTENANCE
EQUIPMENT

DEC. 7

v. 17 #14

1953



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DETROIT 19

◀ **G. F. Chapline**
Genl. Manager
Fairchild Engine . . . 24

Wrights Fly
Without Balloons . . . 13



Douglas F4D Passes
Carrier Tests 20



Record Year for
Aircraft Exports . . . 22



The AF's Strategic
Bombing Mission . . . 54



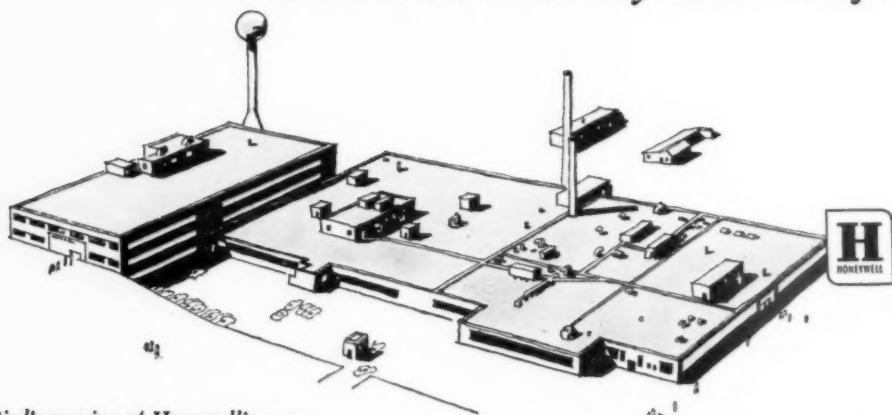
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Air Force, looking ahead, is working on problem of what to do with aircraft industry after production starts downward. Present peak rate of 1000 planes monthly (1953 military sales will top \$8 billion) starts tapering off in middle of next year, will be down considerably by mid-1956.

Problem is being considered at top AF levels; officials want to act as quickly as possible. Aircraft Industries Association, meanwhile, is pushing for a national air policy which will assure:

Active research and development;

Going rate of production sufficient to enable companies to keep engineering and production teams;

Enough competitive plants to provide broad mobilization base, capable of quick expansion;

Healthy private aircraft industry, financially strong and unhandicapped by procurement policies which limit earnings to rates far below national average.

Concern over aviation gasoline production has eased considerably. All controls have been removed.

Petroleum Administration for Defense killed its last restriction (PAD Order 3) a few days ago, claiming oil industry's capacity is sufficient to meet military and commercial needs in the foreseeable future. Order had required that alkylate be used only for avgas production and that feed stocks suitable for avgas be used only for that purpose.

Domestic aircoach traffic has been declining. Downtrend—as much as 40% in some cases—began on transcontinentals about September 15, affects all of them. Load factors 40% to 60%, with estimated 55% average for transcons. Non-scheduled carriers have been off an estimated 40%.

First class is also showing soft spots, but prime trips—nonstops, one-stops, etc.—remain good. Generally, though, business is nowhere near as strong as it was.

Big surprise was that transcon coach dropped while good first-class trips didn't.

Reasons: First, perhaps, is that equipment finally overtook demand, so that for first time since before World War II, the traditional fall-winter seasonal drop is re-appearing.

Second, military traffic and the family travel that went with it fell off; this was largely coach business. Third, general business recession.

Principal conclusion: abnormal situation existing since World War II due to insufficient equipment ended this year. Results weren't evident until fall because summer business is always good in any case and demand used up extra equipment available.

A major international airline already operating Comet I series will shortly announce a substantial order for Comet II's and III's.

Company claims it had less trouble getting Comet I into service, and less trouble since, than any other plane it has ever purchased.

De Havilland's Comet sales, incidentally, have now reached total of 54.



The Washington View

'But Not with a Meat Axe'

The Air Force, Army and Navy budget requests for fiscal 1955, which were due at the Budget Bureau on December 5, are reportedly some three to four billion dollars higher than this year's appropriations. How this increase would break down among the three services could not be readily learned, but there are several factors pointing in the Air Force's favor.

First of all, Air Force Chief of Staff Gen. Nathan Twining has indicated his satisfaction with the way the AF budget request shaped up. Then, in their "new look," the Joint Chiefs of Staff recommended an additional seven Air Force wings. This was topped off by Defense Secretary Charles Wilson's statement that the new budget will have in it the funds for an Air Force buildup to a minimum of 127 wings by June, 1956.

Secretary Wilson seemingly has not been convinced that defense spending can be cut sharply again next year just to meet the Administration's desire for an overall trimming of Federal spending. Wilson has modified his original approach: "He's for economy but not with a meat axe," his aides claim.

The Administration's plan however is to slash the forthcoming budget by nearly \$6 billion—most of it from defense spending. That the great share of the hoped-for savings is to come from the armed services is based on the theory the military spends some two-thirds of the budget and consequently must absorb a proportionate share of any cut.

Saltonstall to Weeks to Sligh

Although Sen. Leverett Saltonstall (R., Mass.) has issued an emphatic denial, reports persist that he plans to retire from the Senate because of his health.

Commerce Secretary Sinclair Weeks' name has been coupled with these reports as the probable appointee to succeed Saltonstall for the remainder of the Senator's term which expires at the end of 1954. The speculation doesn't stop there, though, for like a chain reaction the insiders next have Weeks' successor as being Charles R. Sligh, Jr., president of the National Association of Manufacturers. Sligh recently was the main speaker at the Wings Club annual dinner in New York, and it was

reported that he had been selected to speak as part of a build-up toward his becoming Secretary of Commerce. In addition, if Saltonstall should relinquish his Senate duties, which include chairmanship of the Senate Armed Services Committee, Sen. Ralph Flanders (R., Vt.) would become head of the committee.

Tussle in the Senate

One of the first items on the agenda of the Senate Interstate and Foreign Commerce Committee in the next session will most certainly be a determination as to the future of its civil aviation subcommittee. Because of the situation that has developed, a decision may not be reached without a row. The stage has been set for a showdown between Sen. John Bricker (R., O.), committee chairman, and Sen. John Cooper (R., Ky.), who was appointed to head the subcommittee by the late Sen. Charles Tobey (R., N. H.).

Senator Bricker didn't take over direction of the committee until the closing days of the last session. Although he announced no major policy changes, one subcommittee was abolished outright and further revisions were predicted. Among the other groups, including Cooper's aviation subcommittee, the watchword was expected to be "business as usual" during the Congressional recess.

The work on aviation, however, came to a dead stop this fall, when Senator Bricker abruptly accepted the "resignation" of Frank Kennan, who headed the subcommittee staff for Senator Cooper. Senator Bricker thinks that as chairman he should have a vote by the full committee on whether or not to continue the aviation group. Upon the kind of fight the Kentucky Senator puts up in January will depend whether or not he keeps his subcommittee.

Sword and Plowshare

Rumors that the White House sent a "policy statement" to the Air Coordinating Committee, which might dictate the course of ACC's current aviation policy review for the President, have been emphatically denied by an ACC spokesman. Explanation is that Charles F. Willis, Jr., White House staff member who handles ACC liaison, forwarded a statement (which was neither seen nor signed by the President) which he thought might be "helpful" to people drafting the initial policy papers. Its text:

"This Administration believes in a safe, privately owned, competitive, progressive and, as soon as possible, self-supporting air transportation industry, large enough to extend the benefits of aviation at low cost to all the American people, big enough to expand world trade and contribute to world peace, and strong enough to form a ready reserve for military airlift in event of war. Our air transportation system should be both a sword and a plowshare."

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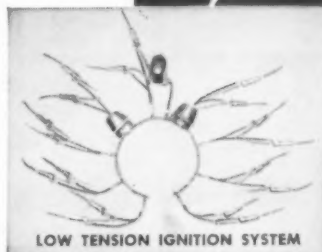
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Cable: AMERAV

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December 7, 1953

Vol. 17, No. 14

Letters	6	N. Y. Airways' First Year	44
Editorial	9	DC-7 Overwater Model	49
Industry Spotlight	11	Military Commentary	54
Wright Brothers Fly	13	West Coast Talk	60
The X-3 "Stiletto"	17	Extra Section	64
First Look at J57	18	Maintenance Bulletin	71
F4D in Carrier Trials	20	New Products	77
News Briefs	20	Airline Commentary	82
Record Export Year	22	People	83
Interview: G. F. Chapline	24	CAB News	85
Safety in Autorotation	28	Statistics	86
AA Likes Bypass Engine	31	International Aviation	87
France's Leduc Ramjet	32	Classified Advertisements	90
Turbo-Compound Production	36	Advertisers Index	92
N. Y. Airline Terminal	38	En Route	94

General Manager: Leonard Eislerer

Director of Advertising: Stephen R. Kent

Circulation Promotion Mgr.: Larry Brettner

American Aviation is published every other Monday by American Aviation Publications, Inc., Washington, D. C. Printed at The Telegraph Press, Harrisburg, Pa. Subscription rates for United States, Canada, Mexico, Central and South American countries—\$5.00 for 1 year; \$8.00 for 2 years. All other countries—\$7.00 for 1 year; \$12.00 for 2 years. Entered as Second-Class matter in Washington, D. C., and Harrisburg, Pa.

Change of Address: Send old address (exactly as it appears on mailing label for your copy of magazine) and new address, including zone number, if any, to 1025 Vermont N. W., Washington, D. C. Allow two weeks for change-over.

Publishing Corporation: American Aviation Publications, Inc., Wayne W. Parrish, president; Leonard Eislerer, vice-president and general manager; Albert H. Stackpole, Jr., secretary-treasurer.

American Aviation incorporates Airports and Air Carriers, Airports, Aviation Equipment, The American Pilot, Aviation Sales and Service, U. S. Aviation and American Airports. All rights to these names are reserved.

ADVERTISING OFFICES . . .

New York Office: Administration Building, LaGuardia Airport, New York, N. Y. Illinois 7-4100, Stephen

R. Kent, director of advertising; A. B. Copeland, regional advertising manager.

West Coast Office: Park Central Building, 412 West Sixth St., Los Angeles 14, Calif. Trinity 7997, Fred S. Hunter, manager.

Chicago Office: 139 North Clark St., Chicago 2, Ill. Central 6-5804, Bruce L. McGregor, regional advertising manager.

Foreign Advertising Representative: United Kingdom—Pearl, Cooper, Ltd., 2-3 Norfolk St., Strand, London, W. C. 2. Tel. Temple Bar 8111/2.

OTHER PUBLICATIONS . . .

American Aviation Daily, a daily news service for the entire industry. \$200 per year. Managing Editor: Keith Saunders.

American Aviation Directory: twice yearly listing of products, people and organizations. \$7.50 each. Managing Editor: Marion E. Grambow.

Official Airline Guide: Monthly publication of airline schedules and fares. \$13.50 per year in USA; \$14.00 in Canada. \$15 elsewhere. Published from 139 N. Clark St., Chicago 2, Ill. Central 6-5804. Managing Editor: Robert Parrish.

American Aviation Traffic News (incorporating Air Tariff Reports): Daily rates and tariff news. \$150 per year. Managing Editor: Wallace I. Longstreth.

When & Where

Dec. 15—Air Transport Association, Board of Directors, Sheraton-Carlton, Washington, D. C.

Dec. 16—Air Transport Association, Membership Meeting, Sheraton-Carlton, Washington, D. C.

Dec. 17—17th Wright Brothers Lecture (sponsored by IAS), U. S. Chamber of Commerce Auditorium, Washington D. C.

Dec. 17—Wright Brothers Memorial Dinner, sponsored by Aero Club of Washington, Statler Hotel, Washington, D. C.

Dec. 17—50th Anniversary of Powered Flight celebration, Officers Club, Alameda, Calif., Naval Air Base. Sponsors include San Francisco Bay Area Chapter of National Aeronautics Association. Dinner dance at 6:30 p.m.

Jan. 8-11—11th Annual Miami-Havana Air Cruise, sponsored by Florida Air Pilots Assn. and Cuban Tourist Commission.

Jan. 18-22—American Institute of Electrical Engineers, winter meeting, Statler Hotel, New York.

Jan. 25—IAS, Honors Night Dinner, Astor Hotel, New York.

Jan. 25-28—Plant Maintenance & Engineering Show, International Amphitheater, Chicago. Conference at Conrad Hilton Hotel.

Jan. 25-29—Institute of the Aeronautical Sciences, 22d Annual Meeting, Astor Hotel, New York.

Feb. 3-5—Society of Plastics Industry, 9th Annual Division conference on reinforced plastics, Edgewater Beach Hotel, Chicago.

Apr. 12-14—Airport Operators Council, 7th Annual Meeting, Tampa, Fla.

Apr. 12-15—Society of Automotive Engineers, Aeronautic Meeting, Production Forum & Aircraft Engineering Display, Statler Hotel, New York.

Apr. 29-30—American Society of Tool Engineers, 10th biennial industrial exposition, Convention Center, Philadelphia.

INTERNATIONAL

May 12-14—Engineering Institute of Canada, Annual Meeting, Quebec.

May 31-June 11—Canadian International Trade Fair and National Air Show, Toronto.

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The first purchase of TVOR by any city in the U.S. was made recently by Santa Monica, California, for use at Clover Field. The equipment chosen — Collins.

Packaged Terminal Visual Omni Range equipment has been in the experimental stage for some time, but not until Collins Radio developed the equipment purchased by Santa Monica has any TVOR actually been purchased by a municipality for use at its airport.

Collins TVOR is to be installed on Clover Field (location of Douglas Aircraft) early next year. It will be operated by the city. Negotiations were completed through Collins' authorized dealer, the Airesearch Aviation Service Company.

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Letters

Letters should be addressed to The Editor, American Aviation Magazine, 1025 Vermont Ave., N. W., Washington 5, D. C. Anonymous letters will not be printed, but names will be withheld upon request.

AUTOMATIC RESERVATIONS

To the Editor:

In the September 14, 1953, issue of AMERICAN AVIATION Mr. Eric Bramley described, on page 93, some of the history behind the development of automatic reservation systems for domestic airlines.

He indicated in his article that the airline industry began working on automatic reservation problems in December, 1947. I should like to bring to your attention the work done by Trans-Canada Air Lines in this regard, which antedates by several years December, 1947.

The idea of establishing a centrally controlled automatic reservation system for Trans-Canada Air Lines was conceived in 1943 by S. S. Stevens, then the director of communications. The task of developing the system was begun under the supervision of T. W. Hall, supervisor of ground maintenance.

The initial design work was carried out in the latter part of 1943 and the first months of 1944. About April, 1944, construction work was started on a model of the system, with H. E. Pretty and the writer participating under the direction of Mr. Hall.

The system involved the use of telephone stepping switches and relay equipment. By dialing six digits on a regular telephone dial it was possible to reserve space up to three months in advance over any one of up to 10 legs of a flight, handling up to 99 passengers.

By a relatively simple attachment on a teletype machine it was possible to reserve space via the teletype circuit, from any point in the system, as well as directly through the central reservation system. The system incorporated safeguards against dialing errors (such as inserting the flight information in the wrong order) and enabled seats to be added or subtracted very simply.

A protective system was installed to guard against garbling in the teletype circuit. This was achieved by storing the incoming impulses in a set of relays, having these relays feed back the information to the originator on his own teletype machine, so that a comparison could be made between the message originated and the message received by the central system.

If the two messages were identical the remote originator would start the actual reservation action by depressing a single key. By prefixing reservation messages with a combination of letters unlikely to arise in normal operational traffic, it was possible to use the teletype circuit for normal operational traffic and handle reservation work as well.

Because of the foregoing, it became

apparent that it would be necessary to develop an automatic teletype relaying system in order to provide the rapid feedback of information from central control to the originator. Work on such a system was commenced about mid-1944 and was fairly well advanced in a few months when the entire project was dropped.

The use of telephone relay equipment would have resulted in a reliable system, but the cost of such a system, together with the amount of space it would occupy, caused the airline management to drop the project.

Through the use of magnetic memory drums and electronic equipment the space problems have been largely overcome, but such refinements were not available to the originators of the TCA system when the work was begun in 1943. Though the results of TCA's work were not formally publicized, the working model was demonstrated to representatives of many airlines, and might well have formed the basis of the work undertaken by American Airlines and the airline industry as a whole.

W. A. COLE

Supervisor—Material Control, E.E.D.
Canadian General Electric Company Ltd.
Toronto 4, Canada

DC-3 CONVERSIONS

To the Editor:

We wish to corroborate the statement in your October 12 Industry Spotlight by Pratt & Whitney that it had no part in the development of the Super-92 engine or its use on DC-3.

We would also appreciate your clarifying and correcting the statement about the "approximate \$15,000 price tag," and the R2000 at \$36,000.

The total price for complete conversion of a DC-3 to Super-92 is actually less than \$13,000 for both engines, installation, and everything, ready to fly. The \$36,000 (also quoted by the same company as \$30,350) mentioned by Pratt & Whitney for its R2000 is per engine, and does not include unstated amounts for necessary different propellers, different oil cooler, cowling, mounts, airframe modifications, installation, etc.

Clarification of these figures makes quite a difference for direct comparisons, and explains a lot of things. It becomes understandable that Pratt & Whitney would not care to comment favorably on proven 200 mph Super-92 DC-3 in competition with its own offering of a 180-190 mph R2000 DC-3, particularly when the Super-92 conversion involves nothing more complicated than a quick, simple engine change, in contrast to the rework required for an R2000 conversion.

Pratt & Whitney's professed concern over the life of the Super-92 at 700 horsepower is not shared by the CAA which approves it, the scheduled

airline which is preparing to change to it, or the executive operators and pilots who have thousands of hours of practical operating experience without structural or other failure of any kind.

Overhaul intervals and costs have been similar to or better than those of regular -92.

To further clarify, although Remmert-Werner does Super-92 conversions, and has changed its executive DC-3 specifications from R1830-75 to Super-92, the Super-92 was originated and built by Engine Works. Incidentally, Pratt & Whitney didn't think much of its own -75 on DC-3's, either, but there have been no complaints from executive operators who have used them five years.

Thank you for your impartial reporting of the matter.

C. S. WEAKS

Remmert-Werner, Inc.
Lambert Field
St. Louis 21, Mo.

COUNTERATTACK

To the Editor:

I couldn't answer Mr. Plank's letter in the September 14 issue word for word, but being a member of the armed forces (Army) I feel a reply is in order. To a great degree Mr. Plank doesn't know what he's talking about.

- I don't think Mr. Plank ever had to move his family on a 24-hour notice; and be separated for periods up to two or three years. General Dean is a good example. Some won't ever see their families—33,000 in Korea.

- Tours of duties in 95% of the foreign countries are not cases of living in paradise. Housing is poor; food is expensive.

- Because of critical shortages of dentists and doctors, free medical and dental care is not always available, especially for dependents.

- Commissaries are being reduced or eliminated by Mr. Wilson.

- PX prices are just as high if not higher than a lot of civilian stores, and I suppose prices will be higher after retail people have their way.

- Housing is very hard to get for the serviceman both in the States and overseas, and if you have children that's just too bad!

- I realize there are many abuses in the services, but I feel efficiency has improved quite a bit over World War II. The taxpayers today, including the military, are getting more for their money.

- If Mr. Plank thinks the services offer so many material things but the brass always abuse them, why doesn't he volunteer his services?

WILLIAM H. BRENNAN

First Lieutenant, Signal Corps
APO 613, c/o PM
San Francisco, Calif.

P.S. The taxpayers need good men to protect \$40 billion yearly investment.

LEAR GIVES SURE CONTROL FOR COWL FLAPS ON CONVAIR 340

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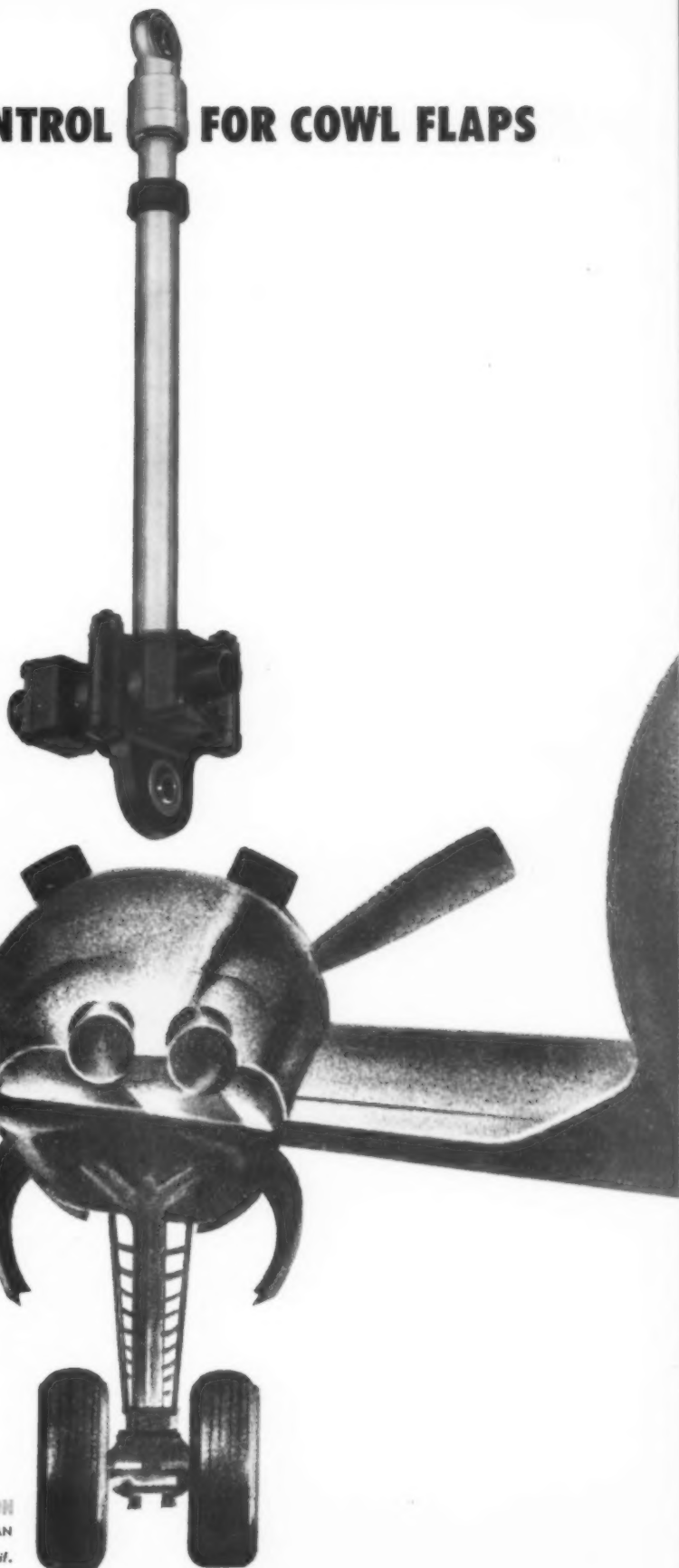
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Editorial

AF Reassurance

ALTHOUGH there had been no great reason to believe otherwise, it was nevertheless reassuring to hear a positive statement of re-affirmation from the Under Secretary of the Air Force, James H. Douglas, Jr., that the new AF command is not retreating from its strong position of favoring long range atomic striking power over and above a reliance on a passive air defense.

Speaking at the Harmon Trophy award luncheon in Washington several weeks ago, Mr. Douglas said we certainly needed an air defense system and all that this involves, but he also made it clear that the Air Force doesn't think it provides our best protection. To do so would be putting second things first.

by
W. W. P.
"Let us make no mistake about our best protection against atomic air attack," he said. "It is a striking power so devastating in prospect that no enemy will launch an attack. And if the attack should come, massive retaliatory striking power is the only sure way to stop it."

Lord Tedder, wartime Marshal of the Royal Air Force and one of the world's most articulate proponents of air power, has summed up the same idea as follows: "It is absolutely essential to remember that purely passive defense with no offensive element is in practice no defense at all."

It may seem strange to airmen that it is necessary to re-affirm the Air Force position with regard to strategic air power, but the fact remains that within the past few years there has been a consistent drive in some quarters, publicized by several newspaper columnists, to devote a large portion of the total defense budget to an air defense program.

To do so would be disastrous both to the country and to the current air power buildup. We are glad to have this official assurance from Mr. Douglas that there will be no receding in the striking power position as far as the Air Force is concerned.

Doom Is Not Yet

CAB Member Joseph P. Adams gave the local service carriers a terrific jolt recently when he served notice that he could see no further financial help forthcoming from the Board and that they would either have to increase passenger loads materially or face extermination. Coming from one of the Board's two most ardent promoters of local service, these were pretty grim words.

The immediate question is what has made Joe Adams execute a hasty 180° turn when only a few months ago he was fighting for expansion and

even for retention of several costly weak carriers. Is the local service industry so hopeless that even its Galahad has decided to give up?

Such a sudden switch is one of the tragedies of instability which has haunted both Board and industry through the years. If the local carriers were worth supporting and expanding six months ago, why preach a gospel of doom now?

The truth is that the Board's two principal supporters of local carriers, Adams and Josh Lee, are becoming as expediently jittery when the going gets tough as they were whimsically and profligately generous in dispensing route miles all over the country without regard for sound, basic economics and common sense when no one was thinking of economy.

What has scared Adams—so much so that he in effect has washed his hands of any further responsibility—is the new trend of subsidy consciousness and government economy. But it would be a little more heartening if the CAB would just once give evidence of faith in its own works and stand pat on its record.

The truth is that up until very recently the CAB—with Adams and Lee as local carrier spokesmen—has expanded a few local carriers into very sparse areas. Some load factors are down simply because the routes were spread too thin. There has been a simply extraordinary lack of understanding within the CAB of the simple ordinary facts of air transport economics, of what makes an airline pay off and what doesn't.

We cannot go along with Adams' rather strange solution that it is now up to the state aviation officials around the country to fill local carrier seats. What more unlikely solution could be found, except perhaps to enlist the support of all Community Chests as well. The real solution to the problem is to be found in the hands of the very Board which has had jurisdiction over air transportation right along. Where else could it possibly rest?

More than one corrective action can be taken to strengthen the local carriers. But quite apart from this, who says that the country is spending too much for subsidy to local carriers? Has Congress, which appropriates the money, said so? Has the Commerce Department? Is it too much that we should be paying \$25,000,000 a year for an actual public service at home, when we have given out sums many times that size merely to tide over a graft-ridden small country somewhere whose name can't even be remembered?

We think Joe Adams might have added to his stature if he had defended, rather than forsaken, the local service program and then started to take some corrective steps which might ease a problem which, at its worst, does not merit the gospel of doom.

... WAYNE W. PARRISH

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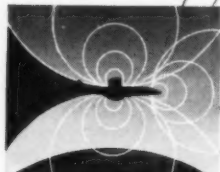
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DEPENDABILITY, TOO—Super Constellations are the latest members of a series of aircraft which have served the Armed Forces and 26 world airlines for 10 years in an unmatched record of dependability.

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With increasing emphasis on continental defense needs, Lockheed is building a record volume of specialized defenders of many types. And production of all Lockheed models is on schedule.

Important members of this Lockheed defense team are these three airplanes:

1. EARLY WARNING—Lockheed Super Constellations, with distinctive radar humps, are "flying radar stations" capable of hovering long hours at high altitude far beyond U. S. borders to warn against attack. (Called WV-2 by Navy, RC-121-D by Air Force.)

2. FLYING SENTRY—For long-range, long-endurance patrols at lower levels, the Navy uses P2V Neptune Bombers, especially designed to protect U. S. coastlines from sneak attack by submarine. Secondary missions: rocket attack, mine laying, torpedo attack, photo reconnaissance.

3. ALL-WEATHER JET INTERCEPTOR—While both the Early Warning Aircraft and the P2V Neptunes are on constant patrol, Lockheed F-94 Starfires are based at strategic continental points, ready to intercept any attacker in daylight or darkness, regardless of weather.

Peace today is as firm as the strength behind it, and other Lockheed models in production contribute toward this peace. These include the T-33 Jet Trainer (Navy, TV-2) in which 9 out of 10 of our jet pilots earn their wings, and the C-130 military transport, only transport designed from the ground up for turboprop power.

PLANS FOR TOMORROW'S PLANES—Several new Lockheed models will be tested early next year. One of these will be the XF-104 Day Superiority Fighter. Others are too secret to be talked about. And designs 10 to 15 years from now are now taking shape in research by a special corps of engineer-scientists at Lockheed.

Industry Spotlight

Additional figures on Fairchild's M-186B jet transport proposal have been obtained. Wing area is 2000 square feet, empty weight 44,000 pounds. Cabin compartment has 2700 cubic feet capacity in cargo version. Normal rate of climb is 5750 feet per minute, single engine rate of climb 2200 fpm, single engine cruise 300 mph, and single engine ceiling 26,200 feet. Stall speed is 109 mph. Fuel load is 22,000 pounds at full gross of 75,770 pounds.

Center of interest in the Fairchild/McCulloch Motors Corp. negotiations is apparently the single place helicopter which the Army is reported showing considerable interest in. Powered by a 45 horsepower engine of McCulloch's own design, the one-man job has an empty weight of 210 pounds and gross weight of 500 pounds. The twin-rotor McCulloch, which was the first tandem-rotor helicopter to get CAA approval, is not considered a marketable unit today. The company's Veebelt drive system has attracted considerable favorable comment.

Latest report is that Douglas Aircraft Co. has changed its sales pitch on the Wright Turbo-Compound-powered DC-7 from "fastest piston engine driven transport" to the "fastest propeller driven transport." Reason—the DC-7 cruises faster than the Vickers Viscount, the only airline turboprop transport in service.

Folland Aircraft Limited's stripped-down fighter, the Gnat, will reportedly also be built in a naval version with folding wings for carrier operations. The Gnat, which has attracted more attention than any of the lightweight fighters, is gradually growing. Growth has seen substitution of Rolls-Royce Derwent engines for the original Turbomeca Marbore engine and this is now being displaced by the Armstrong-Siddely Sapphire. The Sapphire's power, 8200 pounds static thrust, suggests that the plane itself must have experienced considerable growth also.

An artificial stabilizer for "clean" light aircraft is being marketed by Lear, Inc., for March or April deliveries. Priced at \$595, the device, which was designed to prevent the "graveyard spiral," is composed of a servo attached to the rudder control. An a-c alternator is included in the servo with an amplifier used to record signals from a rate gyro. It is built for 1000-hour overhaul periods, according to Lear.

Round-up of new aircraft proposals which have been submitted to the USAF and Navy include stripped-down jet fighters by Temco, North American, and Northrop; a twin jet utility plane by Fairchild; North American's FJ-4 (which may be a Navy version of the F-100); a Grumman jet successor to the F9F-6; Fairchild's six-jet supersonic delta wing bomber and a turboprop cargo plane designed to operate from unimproved fields; jet tankers by Douglas, Lockheed, and Convair; a vertical-take-off fighter by Bell; a large Martin jet flying boat; and a 100,000-pound, triple-tailed cargo plane by Stroukoff Aircraft.

Safe Flight Instrument Corp. of White Plains, New York, is perfecting the Optimum Speed Indicator for heavy transport aircraft. OSI is an extension of the Landing Speed Indicator announced last summer. By extending the lift curve, the instrument gives details, not only on take-off and landing speeds, but also on cruise and maximum range. OSI is now being evaluated by the airlines and the military services.

TWA has completed service evaluation of a Hamilton-Standard-developed integral, oil-controlled, reversible propeller system on a Lockheed 049. The carrier concluded that its operating and maintenance characteristics were generally satisfactory for airline use. TWA management has not finally decided on equipping the 049's, but would choose this system if several recommended improvements could be successfully developed.



B. F. Goodrich brakes stop fast fighter

REPUBLIC'S RF-84-F Thunderstreak lands on B. F. Goodrich brakes . . . brakes designed to retract into thin, swept wings. And made lighter to help save weight for the supersonic fighter's cameras and guns.

A new kind of brake block developed by B. F. Goodrich engineers almost doubles the kinetic energy of the brake. It's a light magnesium shoe with the lining cemented on. It means that a smaller brake can be used, cutting the weight way down. The brake also has a narrow cavity tube that gives more braking pressure with less fluid, and of course with more weight saved. And because the expander tube applies pres-

sure directly to the brake blocks, extra parts and linkages are not necessary.

The B. F. Goodrich Expander Tube brake does a better job of braking. Elimination of the rivets makes it possible to use more of the brake lining. It permits full, positive braking down almost to the metal backing. The braking action applies equal pressure over the full circle of the drum, giving better power, better load distribution.

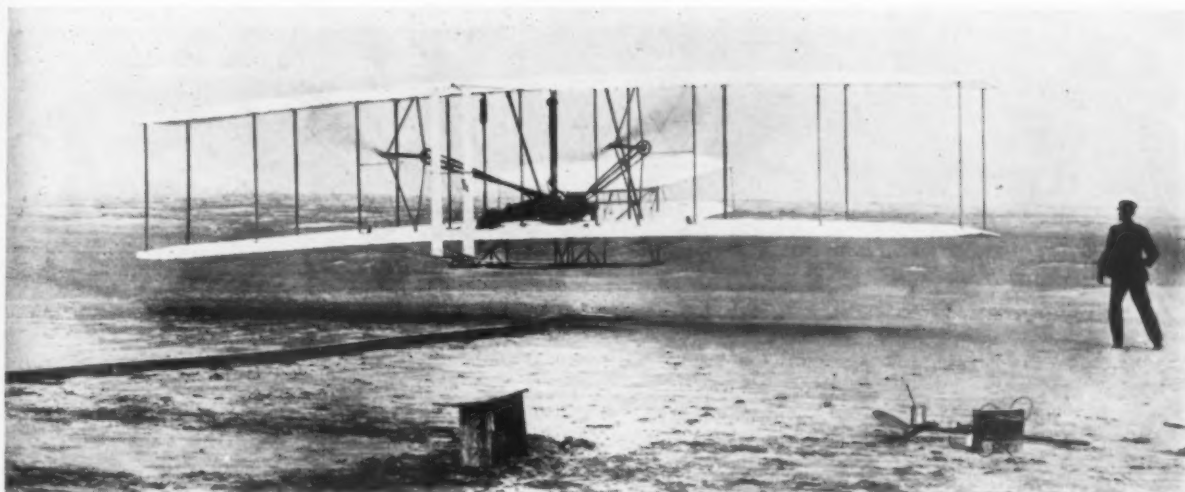
Landings are safer and smoother with BFG brakes. They respond smoothly and quickly to minimum pressure, take emergency overloads better, cannot lock or grab. Ventilated shoe dissipates heat more rapidly. Retractor spring action

eliminates wear due to drag. Relining can be handled with a screwdriver and wrench.

Aviation products to come from BFG's research and engineering include: tires, wheels and brakes; heated rubber, pneumatic and electric De-Icers, inflatable seals, Avtrim, Pressure Sealing Zippers, Plastilock adhesives, fuel cells, Rivnuts, accessories. *The B. F. Goodrich Co., Aeronautical Division, Akron, Ohio.*

B.F. Goodrich
FIRST IN RUBBER

AMERICAN AVIATION



WRIGHT BIPLANE rises from sands of Kittyhawk on the first flight.

Wright Brothers Fly Without Balloons

Bicycle repairmen make four flights in flying machine propelled by gasoline engine.

By WILLIAM D. PERREAULT

KITTYHAWK, N. C., Dec. 17, 1903 —A new step in man-carrying flight was achieved today when two brothers from Dayton, Ohio, made four flights in a heavier-than-air machine without the aid of supporting balloons. The flights were made among the sand hills in a desolate area near here against winds of almost gale force.

One of the four flights lasted 59 seconds and carried Wilbur Wright, the older of the two brothers, who navigated the machine on its longest flight, 852 feet. It was Orville Wright, the younger brother, who made the first trial in this novel aircraft. His attempt lasted 12 seconds and covered about 100 feet.

Only a few witnesses were on hand for these first flights, which took place away from the prying eyes of other in-

ventors and fearlessly remote from medical care should something have gone wrong with the experiments. These witnesses, who have attested to the nature of the flights, included John T. Daniels, W. S. Dough, and A. D. Etheridge of Kill Devil Life Saving Station; W. C. Brinkley of Manteo; and John Moore, a Nags Head boy.



Wilbur Wright



Orville Wright

As these witnesses relate it, this is the manner in which the flights took place:

The first flight was made at 10:35 a. m. into winds of about 27 miles per hour. The machine had been set on a 100-foot-long rail resting on a flat stretch of sand near Kill Devil Hill. Small rollers on the under side of the machine fitted onto the rail, serving in place of wheels, which would have sunk in the soft sand.

The novel looking engine mounted on top of the lower wing of the double-winged flying machine was started up and run for a brief period. Then restraining lines were loosened and the glider lurched forward and into the air. It moved about 40 feet along the rail before becoming airborne and never did get into the air before striking the ground 100 feet away.

The brothers took turns navigating the machine. Successive flights were delayed while minor repairs were made to some of the surfaces, apparently used

to steer the vehicle over its course, which were damaged in landing.

Although the box-kite-like machine traveled over the ground at only about 10 miles per hour, observers related that this meant it was moving through the air at over 30 miles per hour.

The Wright brothers, sons of Rev. Milton Wright, a bishop in the United Brethren Church, are both bachelors. They have become familiar figures around Kill Devil Hill in Kittyhawk since 1900, having spent many weeks here during the past three years in experiments with gliders.

Dangerous Explosive

People in the immediate area recall the disturbance caused during their early visits when they brought the first gasoline to this town for use in their cookstove. Local residents were disturbed over having such dangerous explosives near at hand.

It will be some time before the true meaning of today's happenings can be assessed. Some people feel that the so-called powered flight is just a slight extension of gliding activities which have been going on both in this country and in Europe for some time. They declare that this type stunt shows no promise of achieving the utilitarian status reached by sphericals.

Others claim this may represent the dawn of a new era in transportation. They cite the government's active financing of a program by the Smithsonian Institution to accomplish just such a flight. These trained observers feel that the Wright Brothers' real feat was not in flying but in designing an engine powerful enough to achieve flight and a system of control which permitted the plane to fly over 800 feet.

Tremendous Power

The engine which drove the two propellers, mounted on the back of the thick wings behind the pilot, was of the Wright Brothers' own design and produced the 12 horsepower needed to make the machine operate at these high speeds. Although this is a tremendous amount of power, it is claimed that the Wright engine may produce as much as 16 horsepower for the first few seconds of the plane's movement across the ground.

The Wrights, neither of whom have engineering schooling, nor for that matter any education beyond high school, operate a bicycle repair shop in Dayton. Both the machine and its engine show evidence of this. One roller on which the vehicle slides over the rails during take-off, for instance, is the hub of a bicycle wheel. The chains



Keeping Up the Pace

In this 50th year of powered flight the fast pace of developments did proper honor to the example set by the Wright Brothers in 1903.

- **Official world speed records** fell in rapid succession: North American F-86D (July 16) 716 mph; British Hawker Hunter (Sept. 7) 727.6 mph and Supermarine Swift (Sept. 27) 737.3 mph.; Navy Douglas F4D (Oct. 3) 753.4 mph; and North American YF-100 (Oct. 30) 754.98 mph.

- **Domestic scheduled airlines** completed full year of fatality-free operation (Feb. 11) while flying 13.15 billion passenger-miles. U. S. international operators duplicated the feat (July 28) flying 3.3 billion passenger-miles.

- **First deliveries** were made of Turbo-Compound powered airline transports: the Lockheed 1049C to KLM Royal Dutch Airlines (June 11) and Douglas DC-7 to American Airlines (Nov. 17).

- **Transportation of 3¢ mail** by American, United, Trans World, and Capital airlines was inaugurated (Oct. 6).

- **World's largest helicopters** were unveiled: the Sikorsky XHRS-2 (Sept. 10) and Piasecki YH-16 (Sept. 13).

- **Helicopter extends its role** in passenger air transport picture: Sabena Belgian Airlines begins international service (Sept. 1) and New York Airways starts interstate operation (July 8).

- **First turboprop airline transport**, the Vickers Viscount, enters service on British European Airways, (April 18).

- **Crescent wing jet bomber**, the Handley Page Victor, makes first flight (Dec. 24, 1953).

- **U. S. airpower** totalled 92,579 aircraft, 52,643 commercial, and 39,936 military (Nov. 20) with 19,019 students entering flight training schools annually.

- **U. S. airline employment** reached an all-time high of 105,300 (August). Workers in aircraft and parts industry totalled 748,800.

- **Supersonic jet fighters** made first flights: Navy's Convair F2Y delta wing seaplane (April 9), USAF's North American YF-100 (May 25), and Convair F-102 (Oct. 24).

- **Atomic powered aircraft** program added its seventh aviation firm with announcement (Sept. 30) of USAF-Lockheed Aircraft Corp. contract for A-plane design study.

which carry engine power to the propellers are bicycle chains. One of these is twisted so that the propellers turn in different directions, although the purpose of this is not immediately clear.

While one of the flights today was very smooth, the eyewitnesses reported that the first few flights were made with the aircraft having a difficult time flying a straight and level course. It may be that this was due to the inexperience of the designer/navigators with their newly designed control system.

Like a Saddle

Apparently this system consists of a series of wires attached to a saddle-like structure on which the pilot lies while operating the aircraft from his prone position. By shifting his body so as to move this saddle, the operator moves the set of wires which twist the wings and change the machine's course through the air.

The entire design of the new flying machine was conceived and carried out by these bicycle repair men without the benefit of government support. This puts them in an interesting position to sell the machine to the U. S. government or to other countries if it should prove to have practical applications.

The matter of possible applications is still very vague. Leading aeronauts here and abroad have long discussed the possible civil or military use of powered gliders and the consensus has been that, while such a vehicle *might* some day be made to fly, practical aspects of known design limitations would never leave room for useful development.

Beyond Imagination

This contention may even be strengthened by today's effort. Even to make this simple one man aeroplane fly required a machine weighing 605 pounds empty, measuring 40 feet in wing length from tip to tip and 21 feet in length. To project these figures to truly useful proportions would require a fantastic sized craft and engine power beyond imagination.

More conservative aeronauts and engineers are adding one more note of caution. While it might be possible for a skilled team like the Wright Brothers to design and build such an aircraft over an extended period, what is the likelihood of any factory being able to produce these vehicles if the need arose? And even more important, where would navigators for these aircraft come from, who would train them?

Perhaps the designers have not yet thought of these problems.

Loening Asks CAA Certification Halt

Government supervision of aircraft design and development is hampering progress, Grover Loening has told the National Aviation Trades Association. Loening felt that it was time for a five-year moratorium on CAA's requirements for airworthiness certificates to be called.

"These rules and regulations in general represent the good practice of existing aircraft of the previous year. If there is a departure in design," he continued, "new rules and regulations must be written before any can be made."

"We are fully justified in taking a definite 'buyer beware' position on all airplanes," he pointed out, "and give the designers a completely free hand to make a greater and more profitable business by placing with them the complete responsibility for developing a successful aircraft or sinking themselves completely into bankruptcy by building a poor craft which the public would reject as a phony product."

Highlights of other speeches included:

• **Bradley D. Nash, Deputy for Civil Aviation, Office of the Secretary for Air:** NATA recommendations made to Nathan Twining are being given full consideration and much can be accomplished with them. The suggested ROTC program has obvious merit, he stated, as have the others. He also told the group that there was no need for dual or separate airports for civil and government interests. "Discussions now under way on the subject at Standiford Field, Louisville," he said, "will provide a healthy and constructive guide for future civil-government airport programs."

• **John T. Griffin, vice president-training, NATA:** The military has spent millions of dollars producing duplicate training facilities, while existing civilian schools are closing their doors, he revealed. This in spite of the fact that the military had agreed in principle to using civil facilities before building or reactivating military installations of the same type. He commended the Air Force for its use of the nine primary contract schools, but felt that despite recommendations of both the Stanford Report and Senate Subcommittee on Preparedness Report No. 34, high level military thinking still follows the line that "civil aviation is not useful to the military and that it has not yet learned how to do things as cheaply."



UNOFFICIAL SPEED RECORD has been set by a Douglas D-558-2 Skyrocket piloted by Scott Crossfield, test pilot for the NACA. Top speed reached was 1327 mph, or Mach 2:01; altitude was over 60,000 feet.

CAA Job Cuts Biggest in Agency History

The second major personnel cut-back to hit the Civil Aeronautics Administration in calendar year 1953 and the largest in the agency's history in terms of authorized jobs abolished is now under way.

Administrator Fred B. Lee has issued orders for a reprogramming of CAA activities that is expected to save \$2,584,000 in the balance of fiscal 1954 and reduce annual spending in the salary and expense column some \$9,400,000.

Reduction in force notices that will drop about 150 employees from the payroll in Washington staff offices and another 400 in regional locations are being issued with the target for completion of the bulk of layoffs set at January 1, 1954, in order to realize the expected \$2.5 million savings during the second half of the fiscal year.

Major impact of the new cuts is being felt in the Office of Aviation Safety where the regional posts of divisional chief, a job set up early in 1952 by past director E. S. Hensley, are being abolished.

These positions are now held by E. C. Marsh, Region 1; J. M. Leslie, Region 2; R. W. Delaney, Region 3; and B. M. Jacobs, Region 4. The jobs are being dropped under the new policy of director Alfred S. Koch, who is placing more responsibility for final action with the agent in the field who works directly with the industry.

In the Office of Federal Airways a staff reduction of 63 personnel is slated

to save \$375,000 a year and equipment shutdowns, consolidations, or modifications are expected to reduce CAA expenses another \$4,800,000.

The new cuts in CAA are most drastic in terms of positions being eliminated and will reduce authorized employment from 14,875 for fiscal 1954 to 13,062, a cut of 1813 jobs. With the program completed on about January 1, CAA's payroll will revert to 13,053, the actual level of employment for the year 1949.

Missile Division Set Up at Lockheed

"Recent important developments" have caused Lockheed Aircraft Corp. to set up a new missile systems division at Burbank to work solely on the design, development, and production of guided missiles and pilotless aircraft. The unit will be headed by board member Elwood R. ("Pete") Quesada, former USAF lieutenant general.

Lockheed's nine-month net was \$12.5 million on sales of \$580.6 million, a sharp increase from 1952's three quarter earnings of \$4.9 million on sales of \$287.3 million. About 94% of Lockheed's sales were military.

Backlog, including 94 Super Constellations for 18 airlines, stood at \$1.52 billion on September 30, a 10% decrease from that reported three months earlier.

Douglas Calls for Logistic Cargo Plane

Development of a logistic air cargo carrier "possibly four to five times larger than presently operating craft" should be undertaken by the Air Force, Donald W. Douglas, Jr., told the recent Dallas Council on World Affairs' airpower symposium.

The transport manufacturer said such an aircraft fleet would have "the capacity to deliver the personnel and logistic support of a fighting force to the ends of the earth."

Douglas, who is vice president of military sales for the Douglas Aircraft Co., said a giant transport of this type would be able to carry "tremendous loads at high speeds . . . at reduced ton-mile cost." Powerplants would be turboprops, he added.

While emphasizing that the existing commercial market cannot support the design and development of such a plane, Douglas said that if the military went ahead with the project, airlines would eventually adopt the plane as a freight carrier. Military sponsorship of the development of a huge freighter, he said, would result in a savings of "billions without reducing military effectiveness."

Douglas cited as an example of savings the present nine-month period required to transport and overhaul military aircraft engines. He said this time "could be cut to one-third if the engines were transported by air," a reduction

equivalent to a three-months' supply of engines, which would cost more than air transportation.

Air Force Agrees on Need for Titanium

There is a decisive need for stepped-up production of Titanium, the so-called "wonder metal" because of its light weight and its non-corrosive, heat-resistant qualities, that is not being met today. This is the unanimous opinion of Air Force experts and industry leaders who have been testifying before the Senate Strategic Materials subcommittee, headed by Sen. George Malone (R., Nev.).

Gen. Kern Metzger, chief of the Air Materiel Command's products resources division, told the subcommittee that the titanium situation is "dismal," and that present production does not and can not meet the needs of an expanding Air Force. He agreed with air frame and jet engine builders in their estimates that there would be a need in excess of 500,000 tons of titanium in the case of an emergency.

The Air Force officer recommended to the subcommittee that the government provide incentives, including a guaranteed market, for titanium producers until their plants have been amortized. He also urged government financial backing to companies that want to build a pilot plant to try out new titanium processes.

Eastern Confirms Order For Twelve DC-7's

Eastern Air Lines has confirmed placement of an order for 12 Douglas DC-7 aircraft powered by Wright Turbo-Compound engines and deliveries will begin in the spring of 1955. Cost of the 12 aircraft, including spares, is \$25 million.

EAL, which recently canceled orders for six Lockheed L-1049C's, has already put the first of the 16 remaining Turbo-Compound Super Constellations on order into service.

IATA Conference Links World Tourist Routes

Major features of the 1954 agreements reached at the IATA joint traffic conferences meeting in Honolulu included:

- **Completion** of an air tourist network round the world by introduction of trans-Pacific tourist fares effective April 1, 1954;
- **Addition** of tourist-class service on the mid-Atlantic routes;
- **Agreement** on many conditions differentiating tourist from first class;
- **Initiation** of new quantity discounts for air cargo in some areas; a new universal standard code for acceptance and handling of restricted cargoes;
- **World-wide** standardization of baggage allowances (44 pounds tourist, 66 pounds first) and excess baggage charges (straight 1% of one-way adult fare);
- **Readjustment** of first-class and tourist fare levels.

The trans-Pacific tourist fares are to be 25% below first class, which will remain unchanged except for a few raises to a maximum of 50 dollars. The North Atlantic tourist differential will be slightly narrowed, and both first and tourist class fares raised somewhat to meet rising costs.

Basic North Atlantic fare, first class, London-New York, on season, will be \$400 one way and \$720 round trip, as against the existing \$395 and \$711. Tourist fares will be \$290 one way and \$520 round trip against \$275 and \$495.

Off-season fares between October 1 and March 31 will be \$640 round-trip first class and \$425 tourist. In Europe there will be slight increases in tourist fares to compensate for the increased baggage allowances, but tourist differential will remain 15 to 20%. There will be greater frequency and proportion of first-class service.



New Officer Lineup for Aviation Distributors and Manufacturers Assn. Front row, left to right: L. W. Trees of Bendix Scintilla, past president and member of the advisory board; James Riddle of Narco, vice president; Lawrence F. Zygmunt of General Aircraft Supply, president; R. S. Northington of Piedmont Aviation, vice president; G. B. Van Dusen of Van Dusen Aircraft Supplies, advisory board. Back row: H. Donald Richards, ADMA executive secretary; board of directors include F. D. Morrison of Champion Spark Plug; V. D. Knudsen, Standard Aero Engine, Ltd.; W. G. Smith, Air-Parts; R. J. Montgomery, Packard Electric Div.; R. G. Diehl, Mac-Whyte Co.; J. D. Gibboney, Bendix Products Div.; C. F. Irons, Air Associates; L. J. Bolo, Standard Aircraft Equipment; and Thomas A. Fernley, Jr., ADMA managing director. Elections took place at recent 11th annual meeting in St. Louis.

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"FLYING STILETTO" shape of the Douglas X-3 justified long speculation over the secret research plane's strange configuration.

Douglas X-3: 'The Flying Stiletto'

THE DOUGLAS X-3, dubbed the "flying stiletto" because of its needle-like configuration, has now given the National Advisory Committee for Aeronautics another research aircraft for supersonic flight testing.

Because of its present powerplants, two Westinghouse J34-17 turbojets with afterburners, it is doubtful that the X-3 will match in speed the rocket-powered Douglas D-558-II Skyrocket, in which Scott Crossfield, NACA test pilot, recently reached a record speed of 1327 mph, 2.01 times the speed of sound. Crossfield probably will be testing the X-3, too.

However the X-3 has provided a sturdy airframe for testing turbojet propulsion, rather than rockets, at speeds which might well approach the Mach 2 figure if engines with greater thrust are installed.

Before being turned over to the NACA the plane had undergone flight testing for about a year with Bill Bridgeman, Douglas test pilot, at the controls. This research had been directed by the Air Force, although the Navy had a hand in the X-3's original design.

Before it was built, more than 60 individual designs with all potential supersonic powerplants, separately and

in various combinations, were considered by Douglas engineers working with the military and NACA.

Instead of armament, the X-3 carries 1200 pounds of research instruments. Comprehensive instrumentation includes more than 850 "pin hole" orifices to record pressures over various portions of the airplane. Temperature readings are obtained from 150 points while stresses and air loads are indicated by 185 electric strain gages.

The X-3 joins a famous stable of NACA research aircraft, including the Douglas D-558-II Skyrocket, which is the world's fastest airplane, the Douglas D-558-I, Bell X-4, Convair XF-92A, Bell X-1, and Bell X-5.

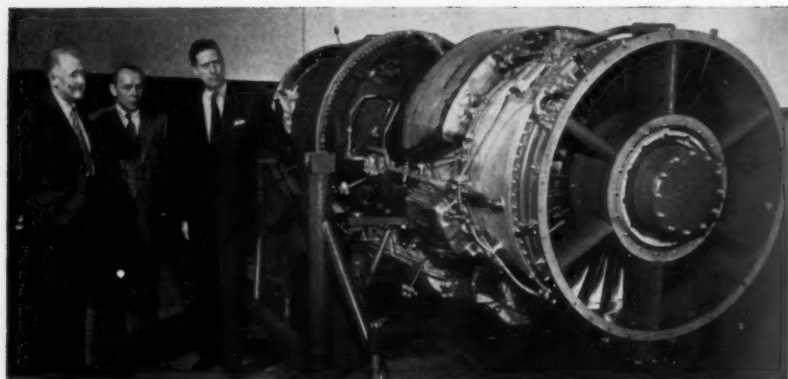
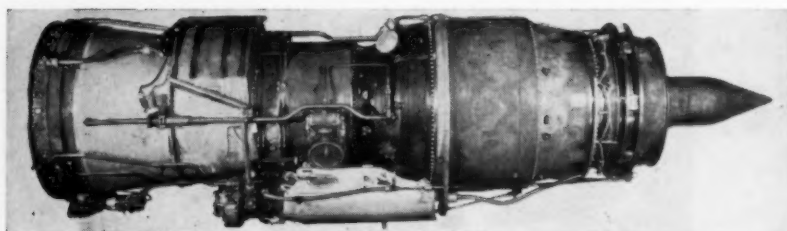
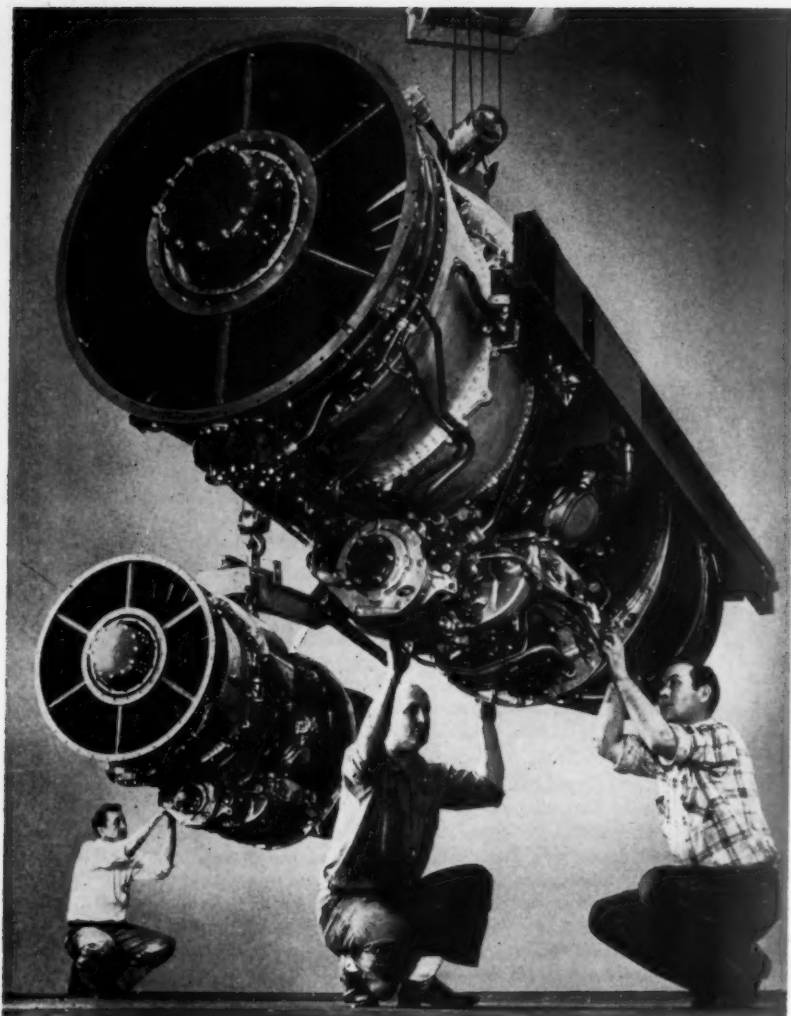
These aircraft also shared some novel design characteristics, including the X-4's tail assembly without a horizontal member, the X-5's wings with variable sweep, and the delta wing of the XF-92.



WING AREA of the X-3, which is said to be about same as vertical tail surface of DC-3, must support a plane grossing more than the DC-3. Large scoops on side are air inlets for the twin Westinghouse J34-17 engines.

DECEMBER 7, 1953

DETROIT PUBLIC LIBRARY



First Look at The P&W J57

PRATT & Whitney Aircraft's J57 engine, now officially labeled by the Air Force as being "in the 10,000 pound thrust class," is a split compressor design which, according to the USAF, has the lowest specific fuel consumption of any jet powerplant currently in production in the U. S. The J57 is the most powerful known to be in production either in this country or in Great Britain, W. P. Gwinn, general manager for P&WA, claims.

The East Hartford company's engine thus far has been flown in the two Boeing B-52 prototypes, in one of the two Convair B-60 all-jet versions of the B-36, in North American's YF-100 and in the production model of the Super Sabre, in Convair's first YF-102 delta interceptor, in Douglas' A3D carrier jet bomber, and in the Douglas F4D Navy all-weather interceptor.

Forthcoming uses for the J57 announced to date include the McDonnell F-101 escort fighter and the Boeing 707 transport-tanker. It is also the power plant incorporated in the jet transport proposals put forth by Douglas and Lockheed and may well be the engine used in Chance Vought's successful entry in the Navy's day fighter competition earlier this year.

In production at East Hartford since early this year, the J57 has also been scheduled for delivery by Ford Motor Co.'s Aircraft Engine Division at Chicago and is still being considered by the Navy Bureau of Aeronautics for output in a plant originally scheduled to build other Navy jets, e.g., Chrysler's J48 or Lincoln-Mercury's J40 facility.

Fighter types equipped with the J57 will use an afterburner for added thrust. The use of afterburning gives the P&WA engine a thrust of between 13,000 and 15,000 pounds for brief periods. . . .

FIRST PUBLISHED photographs of the split compressor J57 engine, which the Air Force has placed "in the 10,000-pound-thrust class." Ford Motor Co. has been designated a second source for the Pratt & Whitney engine, which was the sole power plant to remain unaffected by recent USAF cutbacks in engine procurement.

New lightweight material, easy to de-ice,



protects radar instruments

without distorting the radar signal

Douglas "RADOME"

Problem, in airborne radar, to house instruments in a material which is easy to de-ice. Electro-thermal methods won't do. They affect the radar signal.

Douglas solves the problem with a new material, easy to de-ice. Rods of extruded wax are wrapped in fibre glass

tape, impregnated with polyester resin. With multiple layers, Douglas builds the correct aerodynamic shape, then cures the resin at low temperature, and "sets" it under pressure. Next the temperature is raised and the wax melts away, leaving hollow passages through which hot air

can be forced. No metal. No electricity. No distorted radar signals.

Discovery of a better way to house radar is further proof of Douglas leadership in aviation. Light, tough Radome expresses a basic Douglas philosophy—*farther and faster with a bigger payload.*



Enlist to fly in the U. S. Air Force

Depend on **DOUGLAS**



First in Aviation



DOUGLAS F4D is caught by the camera as it leaves the deck.

Douglas F4D Passes Carrier Tests

RECENT carrier tests with the Navy's new Douglas F4D Skyray have proved the jet interceptor a capable sea-based aircraft.

Evaluation tests aboard the aircraft carrier USS Coral Sea in the Atlantic, just off Norfolk, Va., showed the Skyray adept at catapult takeoffs under varying weights, touch-and-go landings on the comparatively limited space of the flight deck, and full-stop landings by use of the plane's arresting hook engaging arresting cables on the carrier.

The carrier-based interceptor was flown on the tests by Lt. Cmdr. James

B. Verdin and Cmdr. Marshall U. Beebe, Flight Test Division director at the Naval Air Test Center, Patuxent River, Md. Verdin set a three-kilometer course world speed record of 753.4 mph in the Skyray on October 3, 1953 at Thermal, Calif., enabling the F4D to become the first carrier-based plane to hold the world's speed record. The mark has since been surpassed by the Air Force's North American F-100.

Powered by a Westinghouse J40 turbojet with afterburner producing some 13,000 pounds thrust, the Skyray is being produced for the Navy by the Douglas Aircraft Co., El Segundo, Calif.



WINGS FOLDED, the Skyray is brought up from the hangar deck by elevator.



DRAGGING ITS HOOK, the F4D completes approach to carrier's deck cables.

News Briefs

Net profit for Curtiss-Wright during the nine months ended September 30 is reported at \$8.1 million, up from \$5.2 million for the similar period in 1952. Backlog reached \$900 million, including letter contracts.

Liaison plane orders for the Army Field Forces have been increased by 100 Cessna L-19's. Production of the aircraft will be extended through October, 1954, by the million-dollar contract.

Hearings have opened in Los Angeles Federal Court on North American Aviation's suit to restrain North American Airlines from use of the name "North American." Early in November the CAB had ordered the line to refrain from using the word "American" in its name in order to avoid confusion with American Airlines.

Use of Andrews Air Force Base as a secondary airport for Washington National Airport will be outlined in plans due for completion next month. The Air Force agreed to share the field last May.

Earnings of Western Air Lines for the first nine months of 1953 have been reported at over \$960,000, up from \$915,713 during the similar 1952 period.

New president of the National Association of State Aviation Officials is Charles H. Gartrell, commissioner of the Kentucky Department of Aeronautics.

Airlines' reaction to Fairchild's proposed jet transport has been favorable thus far, on the assumption that the capacity of the high-density version will be raised above the 64-passenger total cited in the first description. Fuselage may be widened.

AMERICAN AVIATION

Esso Q.C.*

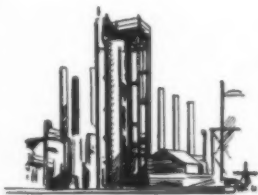
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Aviation gasoline refined in one country may be distributed for use in many other areas. The interval between a refinery run of an average overseas shipment of ESSO aviation fuel, and delivery into aircraft by ESSO Aviation Service, often is measured in thousands of miles and many days. It is transported by tanker, by rail, by barge, by pipeline or by other means.

Yet the quality control of ESSO fuel is vigilantly supervised every step of the way. En route, the product is subjected to numerous quality inspections to insure uniformity and compliance with specifications.



To begin with, a complete analysis is made at the refinery when the newly manufactured fuel goes into storage tanks to verify that the product meets or exceeds government, airline, and ESSO's own standards.

A second series of tests is made on composite samples taken from the tanker immediately after loading.

On completing the voyage, cargo samples of the fuel are checked for quality just before off-loading into ocean terminal storage tanks.



Product samples from the ocean terminal

Yes, ESSO's follow-through tests and analyses make the difference. They mean greater safety and better performance because they guarantee *Quality Controlled* aviation fuel at all times wherever and whenever ESSO aviation gasolines are delivered into aircraft by ESSO Aviation Service.

are subjected to a quality analysis; from the ocean terminal the product may go through an inland storage depot or directly to airfield storage.



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When airport refuelers are loaded, and after each change of shift, the fuel is carefully checked for possible water content and contamination.

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More good reasons why

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AVIATION PRODUCTS

1953 Civil Exports to Reach \$50 Million

Aircraft and engine shipments to total three and one half times the 1950 figure, five times Britain's.

By ANTHONY VANDYK

AIRCRAFT EXPORTS from the U.S. are currently running at the record rate of some \$887,221,000 per year, against Britain's \$182 million. Total value of exports for 1953 will be about three and a half times that of 1950, when the Korean war began, and some seven times that of 1939.

Most of the planes being exported in 1953 are military models sold to America's allies. Although only about 25% of U.S. civil aircraft production is being exported, against Britain's 80%, the value of U.S. sales is five times greater than the British volume. In 1953 exports of U.S. civil aircraft and engines are likely to total some \$50 million.

Encouraging as they are, these figures are misleading since they do not show the sales which the U.S. industry did not secure through potential customer's dollar shortages and lack of initial capital. Factors such as these have been turned to advantage by the British and, to a lesser extent, by the French.

In Britain a government-approved organization known as Air Finance Ltd. (AMERICAN AVIATION, October 12) is prepared to help foreign customers buy British planes on easy credit terms by lending up to 40% of the purchase price. Interest charges will vary with the customer—7½% is believed to be an average rate—and repayments will be by installments spread over three years.

Encouragement of the establishment of a French counterpart of Air Finance Ltd. is under active consideration by the French government in connection with the sales promotion of the Hurel Dubois HD 32, France's DC-3 replacement. As the government is planning to order 150 of these planes, such a set-up would be a logical development.

With foreign governmental sponsorship of aircraft exports on the increase, the State Department and other U.S. government agencies are at last showing

signs that they have a duty toward the nation's aircraft industry (AMERICAN AVIATION editorial, October 26). At a recent meeting in Washington between government officials and the Aircraft Industries Association's Export Committee, industry members agreed to report to the State Department specific cases where the foreign service is not assisting American aircraft sales abroad.

Last June the State Department sent a directive to U. S. embassies, legations, and general consulates abroad to guide their reporting in supplying the government and the industry with the kind of information in which aircraft companies are most interested. John H. Payne, Export Director of AIA, and Irving H. Taylor, a member of the AIA Export Committee, participated in the preparation of the directive.

The latest indication that the government is becoming increasingly mindful of its duties toward the industry in foreign markets is the disclosure that lease-sale arrangements are being studied as part of a coordinated government-industry export sales program.

Lease-Sale

Lease-sale—or conditional sale, as financial circles prefer to term it—is in itself not new. It involves leasing the aircraft to the purchasing airline at an annual rate equivalent to the number of years in the amortization period, or other suitably agreed period, divided into the total cost plus carrying charges, or at another appropriate rate.

Normally the first annual payment would be completed on delivery, with subsequent annual payments made in advance of each year's operation.

The reason that lease-sale has not been widely used in the past has been due to reluctance on the part of financing organizations to risk capital due to such factors as political instability and lack of guarantees. Aircraft companies themselves have shown no great desire to take on the risk or responsibility of financing foreign carriers.

There is one difficulty connected with full implementation of lease-sale. Although hull insurance is obtainable, war risk insurance is not presently available at reasonable terms and conditions. Both are necessary in order to protect capital invested in the event of

political troubles or expropriation of the equipment while located in foreign countries.

A recent law (Public Law 30 of the 83d Congress, Chapter 64, 1st Session, H.R. 4465), "an act to amend the Export Import Bank Act of 1945 as amended," however, offers a possible way to facilitate obtaining insurance protection against political or wartime risks. The insurance would be provided by the government at cost and would not necessarily cause a burden on the Treasury.

Broader Base

Lease-sale is in no way a "give away"—it would provide a broader base for the aircraft industry at no cost to the taxpayer by encouraging private enterprise to do some of the things which the government has been trying to do in the past. Moreover, being on a commercial instead of a governmental level, possible political repercussions within foreign nations involved would be avoided since there would be no question of political obligations for U.S. aid.

Advocates of lease-sale point out that it would:

- Establish a potential future market for replacement aircraft of U.S. manufacture (with parallel benefits for engines and parts producers);
- Encourage the installation of U. S. navigational aids and communications equipment;
- Provide trained personnel for foreign nations who might well participate in any future war effort.

Johnston Elected Head of ACTA

Hamlin B. Johnston last month was elected president of Aircoach Transport Association, filling a vacancy which existed since Amos E. Heacock resigned last February 15. Johnston has been executive director of ACTA since August.

ACTA also increased its board of directors from five to seven, naming four new directors: Adam G. Thomson, Jr., Argonaut Airways; Shields B. Craft, Standard Airways; Robert D. Jones, U. S. Overseas; and Roy C. Briten, Westair Transport. Chairman of the new board is H. B. Robinson, Peninsular Air Transport.

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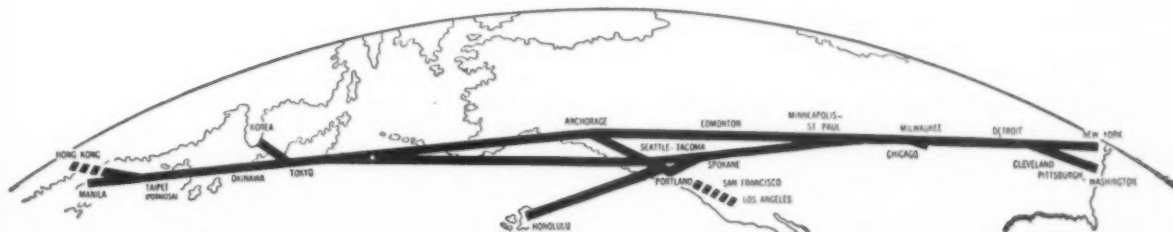
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DECEMBER 7, 1953

with

George F. Chapline

General Manager

Fairchild Engine Division

Fairchild Engine

and Airplane Co.

...

Designing Jets For Simpler Production

...

George F. Chapline, vice president of the Fairchild Engine and Airplane Corp. and general manager of the Fairchild Engine Division, has been an aviation executive since 1929. After joining Fairchild in 1946 he led the company's engine division through the lean years to the point where today it has a nearly \$100 million backlog. This backlog is well dispersed in several types of engines for specialized propulsion systems covering a wide range of applications.

Chapline's aircraft industry experience prior to joining Fairchild included time as service manager, director of sales and service, and vice president of sales for Wright Aeronautical Corp. from 1929-1940. He moved from C-W to Brewster Aeronautical Corp. as executive vice president and later as president, in which post he remained until he reentered the U. S. Navy in 1943 as a Captain on the staff of Fleet Admiral Nimitz in charge of logistics planning.

A graduate of the U. S. Naval Academy in 1916, Chapline earned a Master's degree in Aeronautical Science at Massachusetts Institute of Technology in 1925. A pilot of 30 years standing, he won his wings at Pensacola and served as one of the early carrier and catapult pilots. Later in the mid 'Twenties he commanded Navy Fighter Squadron VF-2.

Currently Commander of Post 501 of the American Legion, a post which boasts such members as EAL president Eddie Rickenbacker, Col. Bernt Balchen, Rear Admiral "Dick" Richardson, Arthur Godfrey, and many others, Chapline is also a Quiet Birdman, a member of the Wings Club, and an Associate Fellow of The Institute of the Aeronautical Sciences.

Q. Would you trace briefly the background of the Engine Division of the Fairchild Engine and Airplane Corporation?

A. The Fairchild Engine Division's experience in powerplant design and production goes back a quarter of a century. Our first aircraft engine was manufactured in Farmingdale in 1927. The well-known Ranger series of engines long set high standards for inverted in-line, air-cooled design and powered many types of civilian and military aircraft. During World War II, the Air Force's primary training program was based on Ranger L-440's in PT-19's.

The Engine Division stemmed from Sherman Fairchild's interests in aerial photography; when he had perfected a satisfactory camera in 1925, he developed an airplane better suited for aerial photography and thereby entered the aircraft production field. In turn, he designed engines permitting better pilot visibility to meet the requirements of his photographic planes and so entered the aircraft engine field.

Q. What are the current areas of activity of the Engine Division?

A. At the end of World War II, the Fairchild Engine Division saw the change that was imminent in American types of powerplants and, viewing this new field, entered the study of unconventional types. This has since led to marked diversification, ranging from jet engines for the missile field to propulsion systems for underwater ordnance.

The jet engines in the missile field provided an excellent engineering and manufacturing background which, in turn, led to subcontract work in building major components for the larger and more outstanding jet engines now used by our military services. The underwater propulsion systems have not only given the Engine Division a good position in that field have led to our development activity on mini-submarines for the Navy Department.

Also, after the training plane program had been curtailed in 1943, resulting in reduced production of Ranger engines, during the war the Fairchild Engine Division went into building auxiliary powerplants. With the advent of rearmament, in connection with the Korean conflict, we reentered the auxiliary power unit field at the request of the Air Force.

Q. Will you be more specific in mentioning major areas of activity at this time?

A. Volumewise, our biggest production, just at this time, is subcontract work for General Electric on major components for the J47 jet engine, which powers the North American Sabrejet and the Boeing Stratojet.

Our next largest production is on the auxiliary power unit, the V32; however, we are rapidly expanding production on the Fairchild monocoque turbojet missile engine, a powerplant of our own design and development.

In the missile field production does not build up rapidly, until after a long series of tests of the missile which the engine powers. The missiles with which we are concerned are just now reaching the volume production stage, particularly the Ryan Aeronautical Company's Firebee, a high-speed, remote-control target drone. The other elements of our J44 program will come in for their share of production at a later date.

'Production . . . on a completely new scale'

Q. What has been the postwar earning record of the Engine Division and its employment levels?

A. A Fairchild corporate policy is to issue consolidated statements and to provide no financial breakdown by divisions. By 1947 our World War II peak in 1944 of slightly over 4000 employees was down to less than 500. Today the Engine Division has approximately 2200 employees. However by the middle of 1954 we anticipate a level of approximately 3000 employees.

This anticipated 1954 growth of our employee force may be attributed largely to the Engine Division's plant at Mineola, N. Y., which is just now getting into production on important and relatively new Government contracts in excess of \$50,000,000. We have shown a profit before taxes consistent with Government bid and pricing policy.

Mineola: Planned Growth

Q. Can you elaborate on the use of the new Mineola Plant?

A. The operations at Mineola are all classified, but we can state that the products to be manufactured are in keeping with the division's experience and "know-how" of jet engines, major powerplant components, propulsion systems, and related units. This facility represents a logical next step in the planned growth of the Engine Division.

At Mineola we occupy a new one-story facility on lease, providing over a quarter-of-a-million square feet of floor space. The main plant in Farmingdale, which we own, another plant at Valley Stream and warehousing facilities at Long Beach—all on Long Island—bring our total floor space up to over 900,000 square feet.

Q. Would you review further your policy to pursue unconventional powerplants as compared with conventional turbines and other types of aircraft engines?

A. Yes. Our policy is that we do not intend to get into competition with the "Big Five" aircraft engine manufacturers. There is, we believe, a growing demand for these small, special-purpose engines in all phases of the military services. They are needed for missiles, target drones, trainer aircraft, and other applications of this general type.

Small and Special

Q. How would you describe your division's thinking relative to production in this unconventional field?

A. Our organization is confident of an excellent production future for these specialized small engines, such as our J44, particularly in the extension of their current applications in target drones and missiles.

In addition, however, the ruggedness and performance characteristics of the J44—which has been used in U.S. missiles fired regularly over the past three years—has confirmed the basic design concept of this jet powerplant for potential use in the power augmentation of piloted aircraft and also craft in such categories as light trainers and administrative planes.

Q. You have made no specific mention of turboprop engines—is that significant?

A. One of our first postwar efforts was a small turboprop engine for one of the military services. This was well along at the time that it was dropped because of a broad policy decision on the part of the service involved. We are still interested in small turboprop engines—or more specifically, geared turbine engines—and only recently have submitted a specific proposal along this line to meet a specific military requirement.

Q. Is this a true turboprop design or a geared turbine engine?

A. It is a turbine engine designed for helicopter applications and using gearing between the engine and rotor. We are proponents of the free wheeling turbine design and in this light it is not "geared."

Disposable Engine

Q. Would you trace the origin of the J44 engine?

A. The J44 engine was designed to meet a Navy specification for a so-called "disposable engine," a short-life engine. The demands were unique for the "state of the art" at that time, and a demand for delivery of the completed engine within one year further complicated the matter.

Q. What was the application?

A. This is still a classified project.

Q. Would you give us a thumbnail sketch of the engine which grew out of this requirement?

A. The J44 is a compact engine using mixed flow, a novel combination of centrifugal and axial flow compressor design, a unique monocoque structure, and several new design concepts. Together these make it the most powerful compact jet engine per pound of weight yet produced. Naturally this is without afterburner.

Rated at 1000 pounds static thrust, the J44 weighs 300 pounds, is 22" in diameter, 72" long, and has a frontal area of only 2.64 square feet. It has a weight thrust ratio of 0.3.

The original application for this engine led, primarily, to the development of the monocoque construction technique, in which the outer shell of the engine is simply a sheet of aluminum alloy with minor cast end pieces for reinforcement. This replaces the cast housing of conventional jet engines.

Q. What is the greatest significance of the J44 design?

A. The real significance, over and above the engine's ability to fulfill this particular mission, is the fact that it introduced ease of production to turbine engine manufacture on a completely new scale. It should be borne in mind that virtually all parts of the J44 will be basically ordinary sheet metal. They can be produced as readily as washing machines

Cost: 'One-third less per pound of thrust'

and other everyday items in case of national emergency.

Q. What does this mean in terms of tooling and production costs?

A. The production tools are easier to produce and consequently cheaper, there is less rejection of parts due to tolerance limitation, and production workers need not be so skilled.

It is too early to give conclusive estimates as to the degree of difference in tooling costs under the two systems or, for that matter, of the probable savings in final cost of the end product to the customer.

Conservatively we feel these engines will cost about one-third less per pound of thrust than more conventional engines.

No Limit on Growth

Q. What is the growth potential of the monocoque type engine?

A. There's nothing inherent in the monocoque design which limits the potential maximum power ratings of such an engine. However, as I pointed out earlier, we have no interest in getting into competition with the big five of the aircraft engine industry in production of high power engines.

Q. Could you give us an example of the advantages occurring from a relatively high power engine designed on this basis?

A. A monocoque engine could be developed which would weigh 2000 pounds yet produce 7000 pounds of thrust. It could also be built with much less raw material.

Q. Would you elaborate on that statement regarding raw material?

A. One of the advantages of this type of design, which I failed to mention earlier, is that there is very little conversion loss in going from the raw material to the finished engine.

The 2000-pound engine mentioned above could be built from raw materials weighing about 2490 pounds. This means a conversion loss of less than 20%, appreciably less than experienced with conventional engine designs.

Afterburner is Practical

Q. Is there any possibility of designing an afterburner for the J44?

A. It is entirely practical. We have made proposals for an afterburner for the J44, but current installations do not require the added power.

Q. What are the current installations?

A. The only application for which military clearance has been obtained is that in the Ryan Q2 Firebee, the target drone. This small ship is either air or ground launched, radio controlled, and serves as a target for training activities. The Ryan parachute recovery system permits recovery of the missile and engine for reuse.

Q. How many flights is a J44 apt to make under such a program?

A. The J44 is essentially a short-life engine. The qualification test is based on 12½ hours cycling operation. We know the engine is suited for a much longer qualification test. Some J44 engines in test flying to date have made as many as five recorded flights in the Firebee, and are immediately ready to go again.

The ruggedness of the J44 is suggested by its ability to withstand the impact of those repeat parachute landings. How many flights they can make only time will tell.

Q. Could you provide us with some specific examples of how engineering ingenuity made the J44 possible?

A. I've already spoken of the monocoque engine housing. To this I might add other examples:

• **Fuel nozzles**—Ordinarily the fuel nozzles of the jet engine are very close tolerance devices costing approximately \$12 each. Our engineers realized that the annular combustion chamber of the J44 would not be so subject to fuel pattern problems over such a wide range of operating conditions. After extensive flow testing and combustion studies we found it possible to use an ordinary industrial oil burner fuel nozzle in the J44. This unit retails for under \$1 and is completely satisfactory.

• **Turbine shaft and bearings**—Our engineers developed a hollow steel turbine shaft, instead of a solid one. Although in our current state of production these shafts require some machining, there is no good reason why high-quality, close-tolerance tubing cannot be used.

The larger diameter shaft provides greater strength at lower weight. To this shaft are bolted small flanges. By using small solid shafts at each end of the main turbine shaft we make it possible to use only two support bearings and even these are very small, approximately 3.46". It has no oil pumps, oil coolers, or external oil lines.

Designed Within One Year

Q. How long did it take to design the J44, and when was it put into production?

A. We met the requirement that it be designed within one year, and had an engine running within 14 months. We produced the first production unit during the first week in 1950.

Q. Would the growth of the J44 require any basic changes in design?

A. For a major increase in thrust certain changes in design would be required in the present J44. A completely new compressor would be designed, but using the results of our J44 experience many components of the engine would see only matching changes. Even current production J44 engines have some changes along this line.

More specifically, high powered engines would prob-

Total development cost: \$5 million

ably use axial flow compressors instead of the mixed flow unit now used.

Q. What is the situation on critical materials in the J44?

A. The percentage as well as the amount of critical materials is very small; these are used primarily in the sensitive sections of the burner and turbine assembly. In redesign, critical materials would be further reduced. Two of the principal cast parts are now being replaced by sections fabricated from sheet stock.

Q. Would you elaborate further on this point?

A. About 80%, by weight, of the J44 engine is made up of strip, sheet and bar stock, all readily available even in national emergencies. Almost 45% of the material is strip, with about 34% of the total strip being low carbon steel and another 10% low alloy steel.

It is significant that less than 10% of the total engine raw material weight goes into forgings and only approximately 5% into castings. These figures are well below conventional engine standards.

Q. How do these materials stand up under the peak operating temperatures of the jet engine?

A. Rated gas temperature of the J44 is 1500° Fahrenheit, and we have found there has been no problem at this level because of our highly selective use of these materials. Effective use of internal air cooling has also been a major factor. The turbine rotor, the most critical single item, is cooled with bleed air which passes through the rotor at the blade roots. Bearing cooling is also aided by air flow.

Development Cost

Q. What was the development cost of the J44?

A. It has cost under \$5,000,000 to develop the J44, which includes operating engines for test vehicles. We believe this is the only jet engine ever developed in the United States at such a low total cost.

Q. What are the possibilities of using the J44 as an auxiliary powerplant to boost transport performance?

A. It has very good potential, and the Aircraft Division of Fairchild is now making a specific study of a universal package which could be used on any transport or cargo aircraft. It will probably be tried out first on the C-119 or on one of the USAF's C-82's undergoing CAA certification test preparations.

Q. Does the J44 design have any appreciable effect on engine overhaul?

A. Yes. The only special tool used for overhaul of the J44 engine, including both disassembly and assembly, is the compressor shaft-nut wrench. Other than this specialized tool, and a regular torque wrench, the engine is overhauled with a few open and box-type wrenches, screw drivers, pliers and a soft hammer, all available in any mechanic's toolbox.

It might be added that there is no single unit in the engine heavy enough to require the use of more than the hand of one man in handling. The engine is assembled by simply placing one part on top of the previous one—simply stacking it together.

Q. What is the nature of the work Fairchild is doing for General Electric?

A. The Engine Division has been doing major subcontract work on the General Electric J47 engine for several years, including mass production of such vital components as the turbine wheel and shaft, nozzle diaphragm and the forward and rear compressor frames—main supporting structure of the engine.

In addition, we have been specializing in volume production of turbine buckets and blades. We are also engaged in the machining of components for advanced models of General Electric engines.

For G.E.: \$80 Million

Q. Has this been a big project?

A. Gross volume of Fairchild business on the J47 work for General Electric has amounted to more than \$80,000,000.

Q. Have you been able to apply any of the producibility knowledge gained in J44 design and production to these more conventional jet engine components?

A. Major reductions in the manhours and tooling required to machine the J47 parts have been achieved here. Ours is purely a production contract for G.E. We make no design changes.

More specifically, we have improved producibility by reducing the number of machines required. In one case we have made it possible for one machine to do the work of seven, and in another case one machine is doing the work it previously required eight machines to accomplish.

Backlog: \$100 Million

Q. What is Fairchild's current work backlog in the Engine Division?

A. It is almost \$100,000,000.

Q. How is this divided?

A. The largest single part, over \$50,000,000, is involved in a Government contract already announced but about which no details have been declassified.

Q. You mentioned the Engine Division has several plants. Could you give more details?

A. Yes. The Fairchild Engine Division has some 900,000 square feet of plant space in this division's activities. About 430,000 square feet are in this plant at Farmingdale, 270,000 at our new plant in Mineola, 170,000 at Valley Stream. The rest is made up of warehouse space.

• • •



THE FLARE angles helicopter upward as Army pilot practices in a Bell H-13. Rotorcraft from Hiller, Piasecki, and Sikorsky are also used.

Safety Shown in Autorotative Landings

Training program drills Army fliers in technique by trying up to 40 autorotations in a day.

By HARRY S. BAER, JR.

WHAT happens when the engine fails during a helicopter flight? Army helicopter pilots know the answer, perhaps better than any other group. Powerless landings in rotorcraft have become second nature to them due to an extensive training program in helicopter procedures which is being taught at the Army Aviation School, Ft. Sill, Okla.

The key to helicopter flight safety when the engine quits is a mechanical process termed autorotation. This automatically places the helicopter rotors in a state of free wheeling, enabling them to continue to turn at a normal rate. The pilot consequently has complete control until his aircraft eases to the ground. Such free rotation which produces lift results from a flow of air up through the rotor system.

It's not uncommon for a student helicopter pilot at Ft. Sill to practice full autorotations (that is, touching the ground each time in a complete simulated landing without power) as many as 40 times during a single day's training. Some 5000 autorotations are accomplished each month at the Oklahoma training site. Accidents have been relatively few, with no fatalities attributed to such practice, Army officials say.

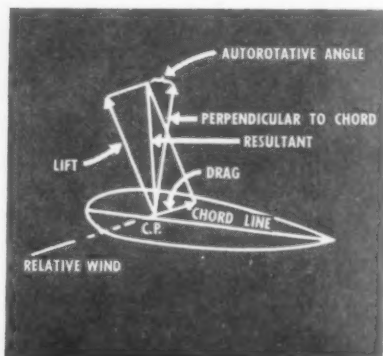
The Army has placed tremendous emphasis on autorotation. Although such practice normally isn't considered the safest form of aerial activity, the

Army has made it seem so at Ft. Sill. It stresses this emergency procedure perhaps more than any of the military services. Since it is the principal user of rotorcraft, the Army wants its pilots completely versed in emergency landings.

Its progress and records in this respect provide an encouraging yardstick by which to measure commercial helicopter safety.

"A lot of people are under the false impression that when the engine of a helicopter quits, you're through," one Army officer commented. "Our day-to-day operations at Sill certainly prove otherwise."

"If there are going to be any helicopter accidents, we'd much rather have them at the training grounds rather than on the battlefield, where these



FORCES acting upon rotors during autorotation are shown above.

aircraft are always at a premium. When our pilots complete their course, they have no fear of power failures. And "they know exactly what to do in order to avert a mishap if they have one."

When the engine quits, autorotation provides full assurance that the pilot can make a rate of descent which will allow him to bring the rotorcraft to the ground in a smooth, cushioned landing. The Army teaches the following methods of autorotation:

• **Running autorotation:** Plane descends at about a 45° angle and has forward speed when it touches the ground. It travels 50 to 100 feet upon contact with the ground. Hard surfaces or moderately smooth terrain are necessary.

• **Modified flare autorotation:** Type most recommended for general use because it provides almost as low a rate of descent as the running autorotation and has the advantage of considerably slower ground roll after touchdown. At about 200 foot altitude, the pilot applies slight rearward cyclic control. This initiates the flare which angles the plane upward. As the helicopter descends in this position, lift is increased and speed is reduced. When the plane touches, it requires a sufficiently smooth landing area for a short ground run.

• **Flare autorotation:** Used for rough terrain or a confined landing area, this method is recommended in emergencies only, when running or modified flare types are not practicable. It enables the helicopter to land vertically with no landing run. Rearward cyclic control is applied to a greater extent than in the modified flare. There is no forward speed when the plane settles.

• **Vertical autorotation:** Rearward cyclic control slows the helicopter to zero ground speed at a high altitude, and the plane descends vertically at a greatly increased rate of descent over the other types of autorotations. Therefore, complete vertical autorotation is not recommended for general use due to the drop speed and reliance on the pilot's vertical depth perception for a successful landing. Except in extreme emergencies, it should not be attempted in winds of less than 20 mph. A number of corrective piloting measures are required for this type autorotation.

• **Low altitude autorotation:** This practice maneuver is aimed at developing the pilot's skill and reactions so he can recover from an engine failure while hovering near the ground. It is done at heights of from three to five feet. Application of right pedal to maintain a straight heading is most essential as the helicopter remains momentarily in position before it begins to settle.

In all autorotations a key point in a successful landing is to set the helicopter down in a position horizontal to the ground. Failure to do so can easily cause the main rotor to chop off the tail boom.

In a recent incident of this nature at Ft. Sill, a student pilot in a Bell H-13E attempted a running autorotation landing with the plane touching the ground in a tail-low attitude. The main rotor began a flapping motion to such an extent that it severed the tail boom. The student was cited for obvious improper landing technique.

Other autorotation mishaps at Sill point out the need for such exhaustive training in the technique of powerless helicopter landings.

One occurred this summer, again in an H-13, the helicopter type now being used most widely in the training program. Here the student pilot was initiating a normal practice autorotation when he noticed another helicopter landing in front of him in the same lane. Uncertain whether he could complete his landing safely behind the plane, he applied power for a go-around at about 300 feet. At this moment he noticed the other helicopter had completed its landing and had moved out of the way. So he changed his mind, cut the throttle, and went back into autorotation.

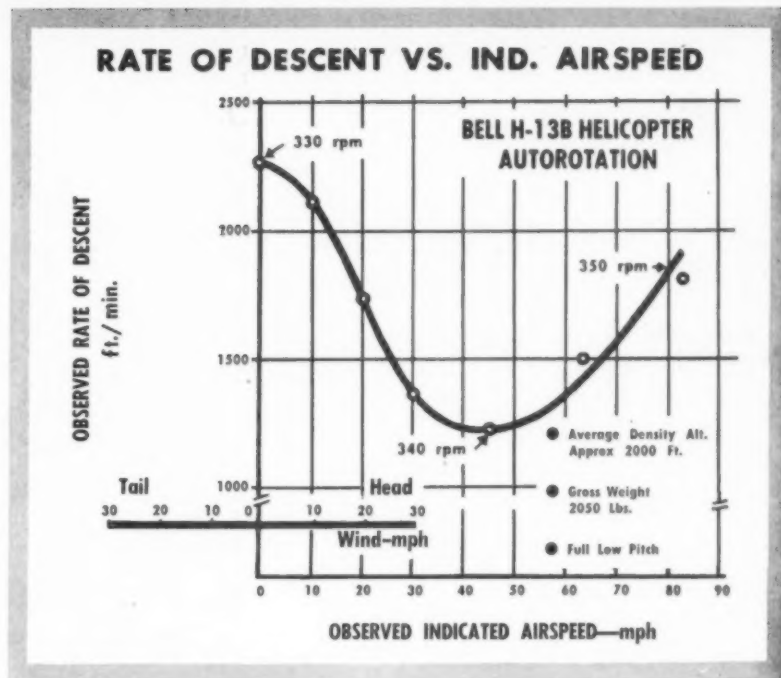
Nearing the ground at somewhat higher speed than normal, he tried to break his rate of descent. But the helicopter did not have sufficient inertia in the rotor to slow down or cushion the landing—this due to the low rotor rpm caused by engaging and disengaging the clutch in his earlier attempted go-around. The helicopter hit the ground hard, skidding 138 feet from point of contact before stopping. Major damage was inflicted on the airframe, with no injury to the pilot.

Ft. Sill safety officers' analysis of the situation was this:

"The primary cause of this accident was student pilot error in that he attempted an autorotative landing from too low an altitude for his stage of proficiency. A secondary cause was the student's failure to comply with flight instructions which state that such solo practice autorotations will not be started below 500 feet above the ground."

Such incidents at Ft. Sill are rare, the records indicate. During Sill's 22-week cargo helicopter course, in which the student pilots have had no previous flying experience, there were more than 26,000 practice touchdown autorotations accomplished between October, 1952, and October of this year. Only nine accidents were attributed to such training.

During this period there were also



RATE OF DESCENT increases after indicated airspeed passes 45 mph.

19 actual forced landings, in which 16 of the helicopters were autorotated to the ground with no damage.

The Oklahoma rotorcraft training school also runs a five week tactical course in which the pilots have had previous flight training. Between April, 1952, and last month these students performed more than 61,000 autorotations. Only four mishaps occurred during this time from such practice. In 37 bona fide forced landings, none of the helicopters was even damaged.

Such statistics point to an almost 100% chance of walking away from a helicopter emergency landing and the safety of a type of flying in which parachutes are virtually useless. This is not only due to customary low-level flight but also to the fact that a parachute jump from a crippled helicopter even at sufficient altitude would be most hazardous. The heavy rotorcraft or its wide-sweeping rotors would most likely hit the parachutist shortly after he left the plane, which would probably drop in the same path.

The mechanical safety mechanisms which make autorotation possible are practically foolproof. They are virtually the same in all types of rotorcraft, such as the Bell H-13, Hiller H-23, Piasecki H-25, and Sikorski H-19, all of which are now used extensively in Army training. Autorotation procedures are likewise similar for the various type helicopters.

When the engine quits, a free

wheeling unit in the engine's transmission enables the rotor to spin freely, due to its initial inertia from the power it has just lost and the force of the air that passes through the rotor in descent. The technical principle of the free wheeling system is about the same as the free wheeling units used widely on automobiles of the early '30's.

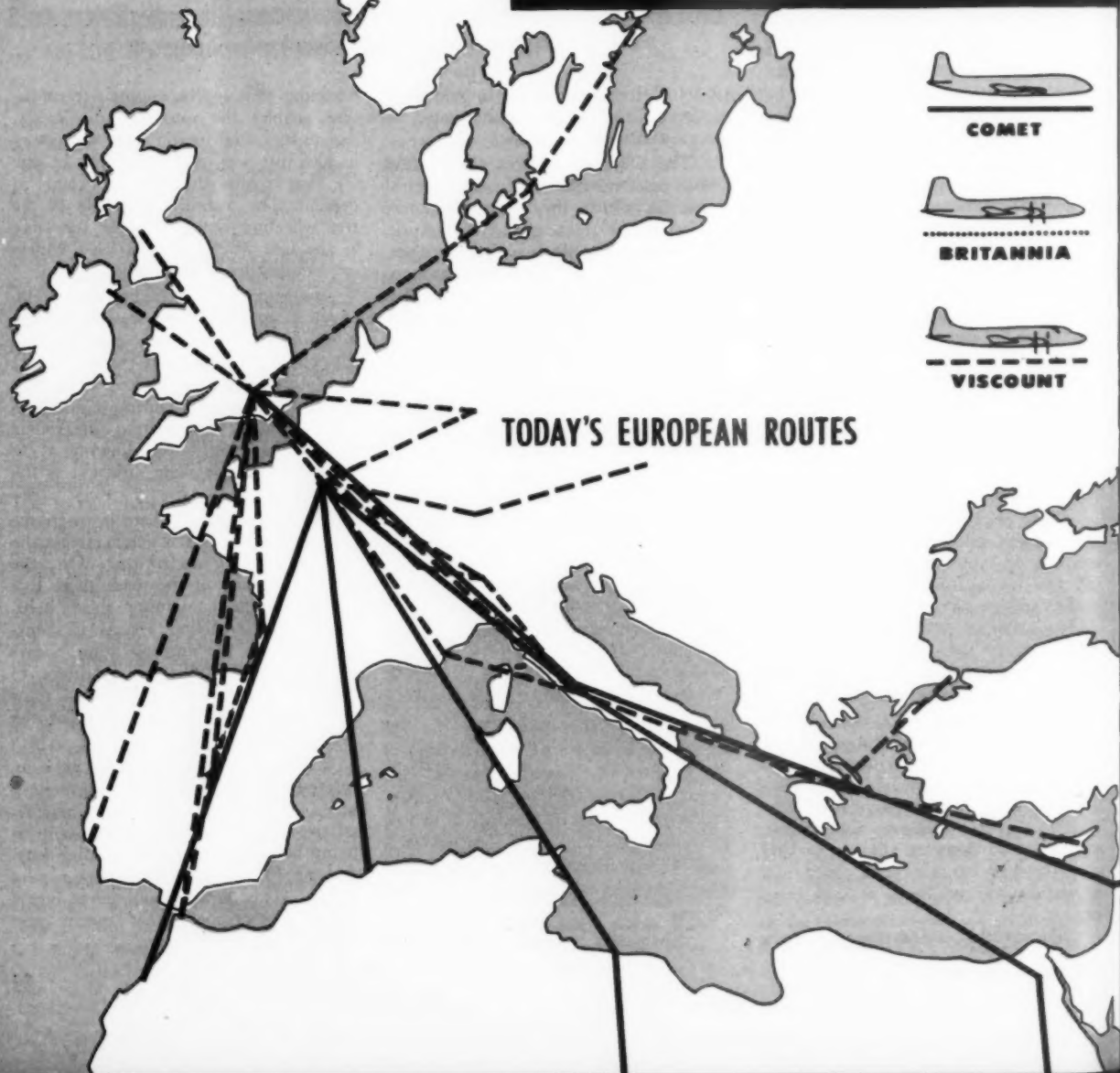
During normal flight, rollers located in wedge-shaped slots of a free wheeling ring gear in an assembly near the top of the rotor shaft (termed mast) keep this ring gear locked to a free wheeling outer ring. During engine failure or practice autorotation, the rollers unlock the ring gear, allowing it to turn freely in the same direction as the main rotor.

What happens if there is an engine freeze-up or oil loss which hampers the free wheeling mechanism? On the upper extremity of the mast, there is a driving flange containing shear bolts. If the free wheeling system is stuck, the force of the turning rotor shears the bolts and the rotor continues to turn for a safe landing. The tail rotor is always driven by the force of the main rotor.

Thus, the helicopter with its autorotative capabilities has proven itself a safe sky vehicle to Army aviators whose training is directed not only to flying but also to extensive ground duty. As one Ft. Sill-trained helicopter pilot put it, "The Army would never buy a piece of machinery that meant sure death if the engine quit." • • •

As U. S. operators remain undecided...

...World Turbine Routes Keep Spreading



COMET



BRITANNIA



VISCOUNT

How Jets, Turboprops and Pistons Might Compare

Estimated Costs	Turboprop ¢/mile	Turbojet ¢/mile	Today's Transport ¢/mile
Flight crew salaries & expenses	13.4	12.4	16.2
Fuel, oil & taxes	28.3	43.4	32.6
Insurance (PL & PD)	7.1	7.1	1.2
TOTAL FLYING OPERATIONS	48.8	62.9	50.3
Aircraft maintenance	12.3	12.0	11.7
Engine maintenance	30.9	27.8	....
Propeller maintenance	1.1	....	16.5
TOTAL FLIGHT EQUIPMENT MAINTENANCE, DIRECT	44.3	39.8	29.6
Depreciation, airframe	33.2	35.5	12.6
Depreciation, power plants	11.3	8.1	1.3
TOTAL DEPRECIATION FLIGHT EQUIPMENT	44.5	43.6	13.9
TOTAL DIRECT FLIGHT EXPENSE	137.6	146.3	93.8
Ratio per mile cost	1.00	to 1.06	

Turboprop or Turbojet? Neither, Says AA

Carrier comes out in favor of bypass engine over turbojet; engineers dub turboprop uneconomic.

THE TURBOPROP transport, which only a few months ago got its strongest, most outspoken support from American Airlines president C. R. Smith, now fails to pass the test of economic potential, according to that company's top engineering brains.

The turboprop-powered transport, says W. C. Lawrence, director of development engineering, and H. E. Hoben, director of aircraft analysis, runs a poor third to the potential of the ducted fan, bypass engine or turbojet.

Rising star in the American scheme of transports to come, the AA engineers told a joint meeting of the Washington-Hagerstown sections of The Institute of the Aeronautical Sciences, is the bypass or ducted fan engine. "It is likely that the bypass engine will be the key that opens the door to widespread use of the commercial jet transport," they predicted.

"Our answer to the question of turboprop versus turbojet is neither, for the present, unless our hand is forced by competition.

"This somewhat negative position, which we believe is common to the majority of United States domestic airlines, may come as a surprise to many who hear it. The question will arise: how do we expect such a stalemate to last? What we are waiting for is further development. The wait may not be long as one would think.

"Our chief objections to the turbojet engine stem from its excessive cru-

ising specific fuel consumption, its relatively low take-off thrust, and the noise which it produces at high powers near the ground. Our chief objections to the turboprop engine are its complexity of control, and the noise which it produces in cruising flight within the passenger cabin."

Hoben and Lawrence went on to describe the ducted fan, or bypass, engine as "a gas turbine engine, probably a twin-spool arrangement, with a large and relatively low-compression front compressor stage. A portion of the air from this compressor bypasses the combustion chamber and turbine, and is accelerated to the rear through an annular nozzle surrounding the tail pipe."

The weak link in the American proposal, cited both in a previous presentation of the same paper in California and at Hagerstown, is the non-existence of such an engine today. The British are working on such an engine, the Rolls-Royce Conway.

But the U. S., both at the research levels in such places as the National Advisory Committee for Aeronautics and at the design specification levels of the military services has rejected the ducted fan and bypass engines. The engine manufacturers, some of whom claim that the general design shows high promise, have not found it economically possible to pursue development of an jet engine which the military is not willing to support.

The prime limitation of the ducted

fan engine is that its peak performance, an area in which it is generally unexcelled, is in the 500-600 mile per hour speed range. This speed range has little appeal to the military services which have production jet fighters flying at supersonic speeds and which, to date, have largely ignored the military potential of turbine-powered transports.

Signs that this attitude toward the need for the ducted-fan or bypass engine are changing are vague if not non-existent. The current attitude: "If the bypass engine is successful (in Britain) we will buy this specialized engine from the British or license it for production here."

A major contribution of the Hoben-Lawrence paper is the economic analysis of the future aircraft powered by turboprop or turbojet engines (see table above). The Douglas DC-6 has a direct operating cost of 92.1¢ per plane-mile. The proposed jet transport's comparable cost is 146.3¢. These costs are based on reasonable cost estimates (initial aircraft cost of \$3.5 million, fuel cost 6½¢ below aviation fuel, 8 hours utilization, and seven years depreciation period).

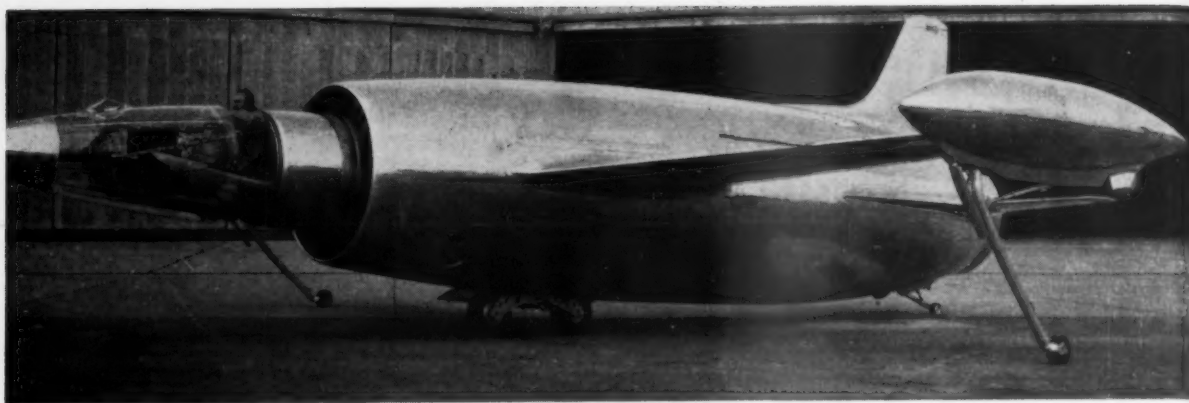
To justify this increase in cost per aircraft-mile (cost per hour would be even higher), the AA engineers said, the jet transport would have to be a 90-100 passenger craft, compared to 58 passengers for the DC-6. Although this size is "somewhat larger than we had intended," American claims, such a design now seems "entirely practicable" with the availability of higher thrust engines, lengthened fuselages, and other structural gains.

Of prime importance is the documenting, apparently for the first time, of the fact that there will be relatively little difference in the cost per plane-mile for the turboprop and turbojet transports, the turbojet cost running only 1.06 times (146.3¢) the 137.6¢ cost of the turboprop.

Also to the detriment of the turboprop aircraft is its early obsolescence because of limited speed potential, sensitivity to propeller overspeeding, complex powerplant control system, and noise and vibration in the cabin, the engineers told the LAS.

Where does this leave American?

"As a flying machine we like [the jet transport]; we should like to offer the improved service that it can provide," says AA. "But, frankly, we are afraid of its price, its size, its appetite for fuel and its noise. This feeling may change with further development or with more experience. It could conceivably change very quickly if some bold individual buys a few jet transports for operation on a competitive route."



MINIATURE UNDERCARRIAGE and plastic cockpit of Leduc 021 are shown above.

France's Leduc Ramjet Completing Tests

Ramjet fighter due for development from present prototype; investment termed 75% complete.

By JEAN-MARIE RICHE

PARIS, FRANCE—With the tests of its first model 021 progressing satisfactorily, a second 021 scheduled to fly early next year, and construction of its supersonic 022 well in hand and set for completion at the end of 1955, Rene Leduc faces the latest but hardest phase of his experimental work on ramjets. A ramjet-powered interceptor fighter will be developed from the 022.

Leduc's work on the ramjet goes back a long way. In 1929 he had the idea of jet propulsion and in 1932 came to the concept of the ramjet itself. He conducted the first experimental work on it between 1934 and 1936 in a small shop in the Paris area. In 1937 he got an order from the French Government for a small experimental aircraft which was to become the Leduc 010.

The war stopped this development and the plane did not get into the air until April, 1949. The Leduc 010 then proved the validity of the ramjet formula, about which many technicians previously shrugged their shoulders.

The 010 was, however, only the first experimental flying test bench from which the 016 and 021 aircraft were developed. Leduc has been often criticized for his slow progress. It is not understood why he insists on building in his own shop the cockpits, the pumps, the landing gears, and the automatic controls for his aircraft. Leduc replies that all his problems are so special that he cannot find suitable equipment on the market, nor can he interest outside man-

ufacturers because he has no production line.

These equipment problems remain, however, relatively limited because Leduc's ramjet is the simplest aircraft imaginable.

It consists of an unusual oval body housing a turbine, a pump, and seven concentric rings, each ring including three circles of burners, the size of which increases toward the tail of the aircraft.

Plastic Cockpit

Two straight wings and a small tail are attached to this main portion, in front of which is a most unusual conic plastic cockpit mounted right in front of the intake of the ramjet main section. Fuel tanks are mostly in the wings, with some in the main body of the aircraft.

Except for the turbine and pump, there are no revolving parts in the aircraft. One of the main difficulties is to adapt conveniently the fuel flow between the tanks and the burners (an early prototype was badly damaged while making an emergency landing because this problem had not been adequately solved) and to test the combustion in the ramjet at high altitudes.

Only flight tests could give the answer to many problems which the builder himself was unable to solve by calculations or ground tests that he conducts in his small but adequately equipped Argenteuil shop.

More than 40 flight tests with the 021 have given enough answers to start building the 022. This will be the first of the Leduc family to take off under its own power.

The 022 will include a SNECMA Atar turbojet delivering enough thrust to bring the aircraft to the speed and the altitude where its ramjet can be used without consumption penalty. The 022 will look more elongated than the 021. It will have swept-back wings (swept about 30°) and a structure allowing supersonic speeds of at least Mach 2 at 60,000 feet.

It will be a sensational climber. Already the 021 climbs at the rate of 655 feet/second (ground) and 65/80 feet/second at 55,000 feet. Leduc has calculated that, in order to obtain performances equal to that of the 022, one would have to build a jet developing a thrust of 60 tons in an aircraft whose total weight would have to remain under six tons. A rocket might do the job but would consume a weight of fuel six times as high as that of the ramjet, and have no practical range.

Leduc estimates that financially he has reached a stage where 75% of the investment necessary to develop his ramjet is made. It is therefore most unlikely that French authorities will stop supplying him with the money necessary to achieve its first 022 prototype and start construction of a second one. From these will be developed the simplest (construction-wise and maintenance-wise) interceptors of the French Air Force of the late Fifties.

Hard research work by Leduc and his staff and experimental work by his pilots Litolf and Sarraill lies between the actual aircraft and these developments. But the French engineer knows that his ramjet works well and that his present experience constitutes a background for the important and valuable work still to be done.

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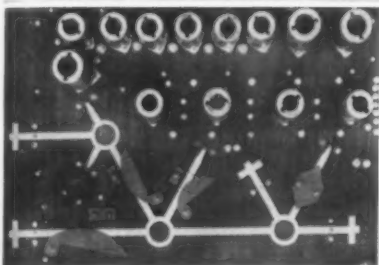
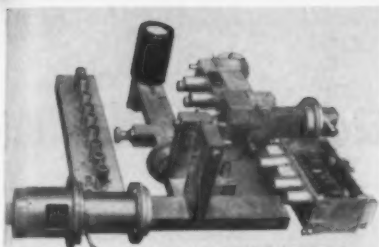
Cabin Supercargers

Pneumatic Power Units

Electronic Controls

Cabin Pressure Controls

Temperature Controls



MICROWAVE RECEIVER built with standard "plumbing" weighs 32 lbs. (top); microstrip weight (bottom) drops to 5 lbs.

Microstrip Available For Industry Use

Microstrip, the recently developed method of wiring microwave circuits which promises to revolutionize aircraft radar devices and electronic units for missiles, has now been made available to the electronics industry by Federal Telecommunications Laboratories, Nutley, N. J.

Effect of this development on the industry is best illustrated by the relative cost and weights of Microstrip units compared with conventional microwave "plumbing." A "magic T," a common junction assembly in microwave circuits, may cost over \$100 and weigh 15 pounds. The Microstrip-designed magic T will weigh a few ounces and cost about one dollar.

Under the terms of the newly announced licensing policy FTL, a division of International Telephone and Telegraph Corp., will license manufacturers to use the processes covered by some 40 patent applications on a royalty basis. Basic provision of the royalty arrangement amounts to about 1% with a minimum charge of \$1,000 per year.

Another royalty arrangement has been worked out to cover component manufacturers. This provides for special one- and two-year licenses to help speed production of Microstrip units.

Microstrip components are produced directly from wiring diagrams etched or embossed on a dielectrically coated base plate. The process is the outgrowth of FTL's experiments showing that the average microwave circuit, including widely used coaxial cables, is overdesigned for the job it is doing.

DECEMBER 7, 1953



LAND-AIR Engine Analyzer

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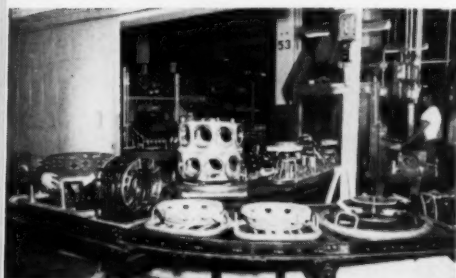


General Offices:

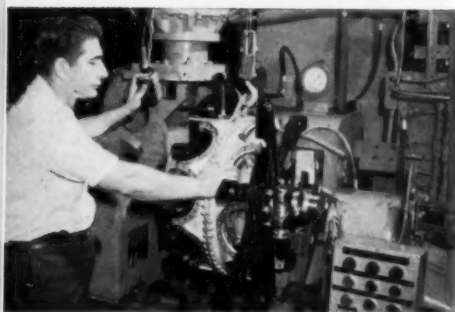
201 NORTH WELLS ST., CHICAGO 6, ILL.



PALLETS carry engine parts on specially designed roller conveyor to wash booths for spray cleaning.

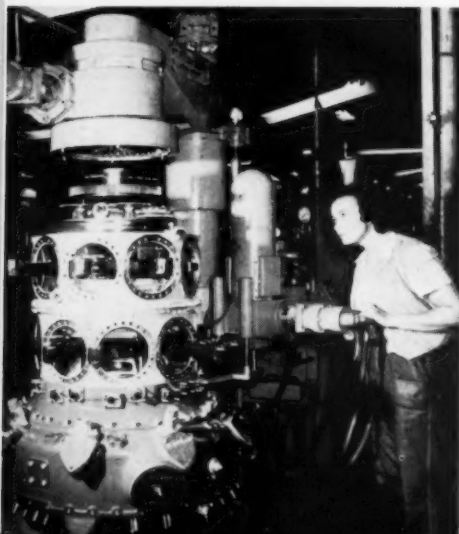


SPECIAL PALLETS move cylinders and pistons on conveyor lines to nearby assembly station.

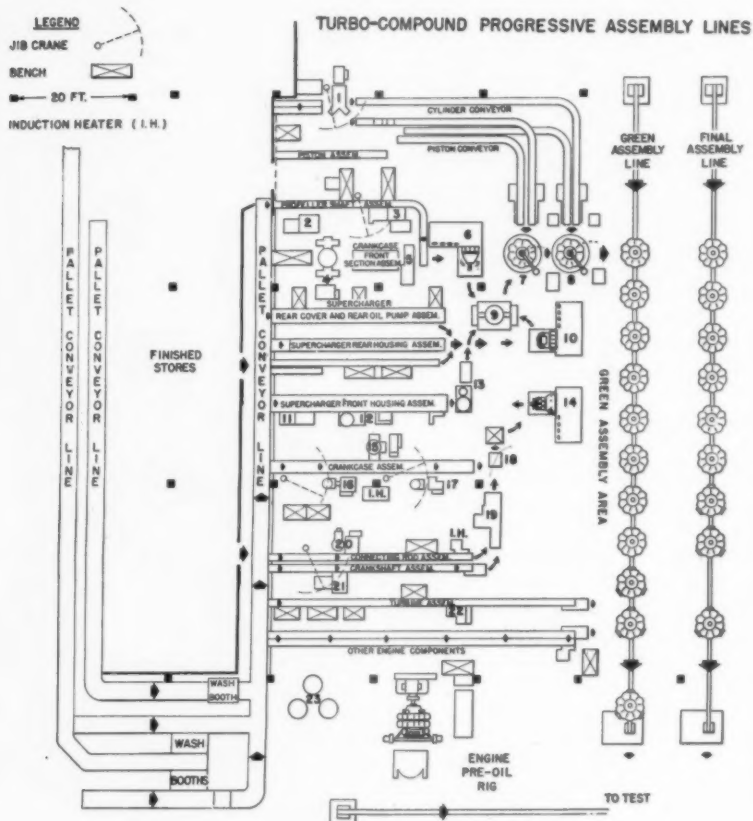


THREE crankshaft sections are clamped in special machine for automatic assembly into one unit.

REDUCTION DRIVE GEAR will be tightened and locked by automatic torque machine shown below.



Automatic Assembly Line



EXPLANATION OF DIAGRAM

1. CYLINDER ASSEMBLY MACHINE.
2. PINION CARRIER TO PROP. SHAFT INSTALLING MACHINE.
3. PINION RETAINING BOLT INSTALLING MACHINE.
4. FRONT SECTION HOLDING AND TORQUING FIXTURE.
5. FLANGE ATTACHING SCREW INSTALLING MACHINE.
6. FRONT SECTION MOTORIZED FLOW RIG.
7. CRANKSHAFT INDEXING AND FRONT CYLINDER INSTALLING MACHINE.
8. CRANKSHAFT INDEXING AND REAR CYLINDER INSTALLING MACHINE.
9. SUPERCHARGER FRONT AND REAR HOUSING INDEXING JIG
10. SUPERCHARGER REAR HOUSING MOTORIZED FLOW RIG.
11. FLUID COUPLING ATTACHING SCREW TORQUING MACHINE.
12. TORQUE HEAD INDEXING ADAPTER.
13. REDUCTION DRIVING GEAR TORQUING FIXTURE.
14. POWER SECTION FLOW RIG.
15. OIL DISTRIBUTOR RING TO CRANKCASE INSTALLING AND TORQUING MACHINE.
16. CAM SUPPORT TO CRANKCASE INSTALLING MACHINE.
17. COUNTERWEIGHT ATTACHING BOLT TORQUING MACHINE.
18. CRANKCASE ASSEMBLY FIXTURE.
19. CRANKSHAFT ASSEMBLY MACHINE.
20. KNUCKLE PIN RETAINING BOLT TORQUING MACHINE.
21. COUNTERWEIGHT HYDRAULIC TORQUING MACHINE.
22. POWER RECOVERY TURBINE NUT HOLDING AND TORQUING FIXTURE.
23. IGNITION HARNESS ASSEMBLY FIXTURES

PLAN VIEW of new C-W shop above pictures flow from finished stores areas at left through wash booths to sub-assembly stations. Green assembly line feeds engines to initial test and final line at right to customer.

y Lin C-W Turbo-Compound

LINES

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A NEW "AUTOMATED" engine assembly line capable of increasing the potential production output of Turbo-Compound engines as much as 250% while using 42% less plant space was unveiled last month by Curtiss-Wright Corp. at Wood-Ridge, N. J.

C-W president Roy T. Hurley estimates that with the new facility a Turbo-Compound engine can now be assembled at one-half the former cost while using only one-half the manpower previously required.

The Curtiss-Wright installation combines a network of roller-type conveyors for moving parts from finished stores areas to shop sub-assembly locations with a mixture of overhead monorails and automatic machinery for joining engine sections within assembly tolerances unmatched in accuracy by previous hand methods. In one operation the new methods produce the same assembly job 500% faster than before.

Automatic oil flow rings clean the oil passages of each major section of the engine before final assembly and remove any remaining metal chips or foreign material from the engine. Powerized floor conveyors move the engines along two assembly lines, with the complete line moving from station to station along a 12-point line at a predetermined time cycle.

A "green" line builds up engines for test run-in, after which they are disassembled and inspected, and a duplicate final assembly line produces the finished Turbo-Compound for packaging and final delivery.

Throughout the 68,881 square foot assembly area 15 separate roller conveyor lines use 1350 specially designed pallets of 45 different types to assure maximum protection for parts while in transport to sub-assembly locations.



POWERIZED CONVEYOR LINES in foreground move pistons and cylinders to sub-assembly area. In background technicians install cylinders with engine mounted on vertical rolling stand.



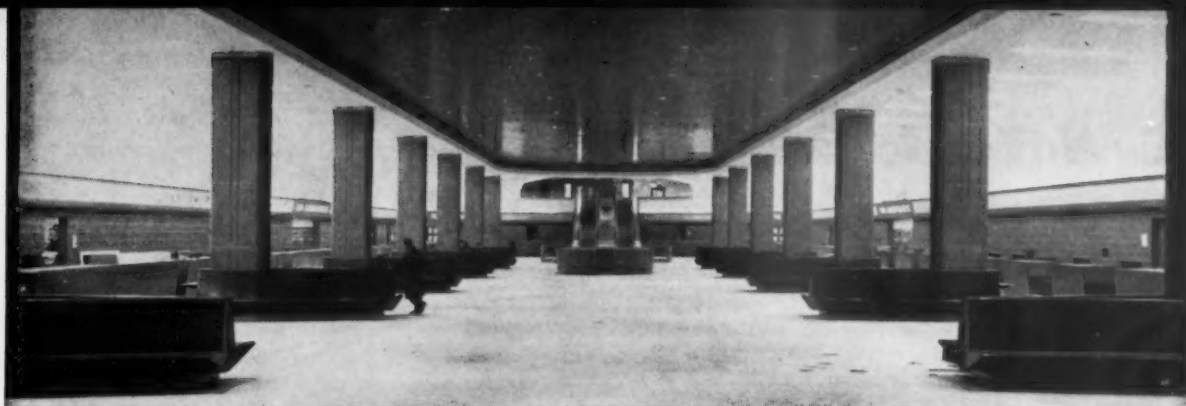
PINION RING carrier machine operated by Joseph Johnston tightens bolts and crimps fasteners in front section.



POWER RECOVERY turbine shaft stretch is closely controlled by machine tightening, demonstrated here by C-W shop technician.

AUTOMATIC TORQUE MACHINE operated here by John Sylvester tightens bolts joining Turbo-Compound's power section master rods to eight piston link rods.





VIEW OF MAIN LOBBY shows escalators leading to mezzanine.

New Terminal Building Opens in New York

All bus movements and facilities centralized for 20 carriers in \$7 million East Side structure.

By ERIC BRAMLEY

THE \$6,970,000 East Side Airlines Terminal, which opened December 1 in New York, centralizes all airport bus arrivals and departures for 20 airlines and is expected to handle three million passengers during the first year of operation.

The new terminal, fronting on 1st Ave. between 37th and 38th Sts., is immediately adjacent to Queens Midtown Tunnel, which is used by buses traveling to and from LaGuardia and New York International Airport. Until completion of a west side terminal at 10th Ave. and 41st St., tentatively set for 1955, Newark Airport buses will have to cross the midtown area.

Formerly there were 10 loading and unloading points in the midtown area in addition to Airlines Terminal. Carriers use the new terminal primarily

as a central arrival and departure point: they are maintaining all Manhattan and Brooklyn ticket and reservations offices. Largest of these is Airlines Terminal, which is being renamed Airlines Building.

The new air-conditioned building, designed by John B. Peterkin and constructed by S. S. Silberblatt Inc., was situated on the 411-foot x 197-foot 1st Ave. site because of a city ruling that street loading was to be banned in an area from 18th to 59th Sts. and from 8th to 3rd Aves. On a normal day, airport bus movements in this area totaled 788, aggravating the already-congested traffic situation.

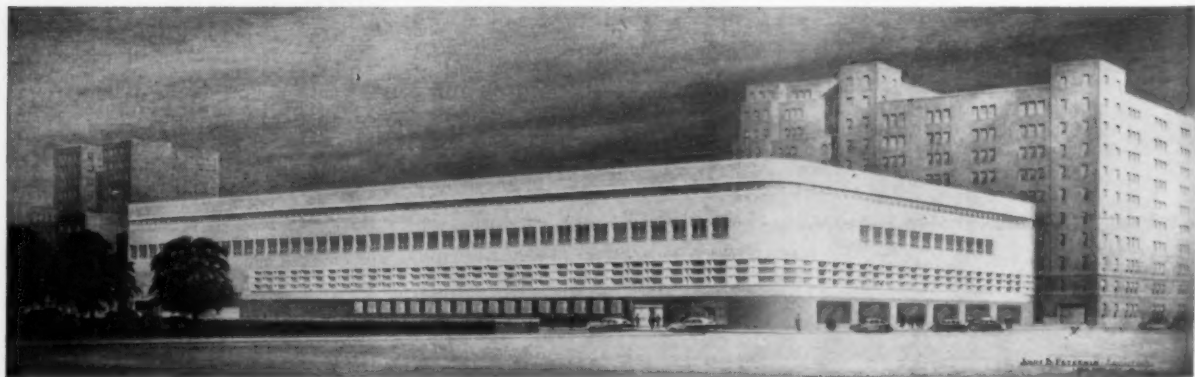
Thus the terminal is not as centrally located as was Airlines Terminal on 42nd St., and most passengers will have to use taxis to reach it. There are crosstown buses at 34th and 42nd Sts. and 1st and 2nd Aves. (1st Ave. is one-way north).

The 20 airlines using the new building are American, Capital, Colonial, Eastern, National, Northeast, Northwest, Pan American, TWA, United, Trans-Canada, El Al, BOAC, SABENA, Swissair, KLM, SAS, LAI (Italian), Air France, and LAV (Venezuelan).

The terminal consists of a basement, three floors, and a roof parking area (which is stressed for future helicopter operations). On the 1st Ave. side taxis and private cars load and unload in an enclosed arcade, and passengers proceed via escalator to the main concourse on the second floor. There is also a taxi-auto entrance in the rear on Tunnel Approach St.

On the second floor, the oval-shaped main lobby contains ticket counter space for 10 U. S. and eight European lines. All but one of the latter also have counters in the upper concourse, the floor above the lobby, where airline office space is also located. An escalator connects the two floors.

The enclosed U-shaped bus deck circles the outside of the main lobby. All buses enter up the 38th St. ramp,



ARTIST'S CONCEPTION of final form of new terminal building.

discharge or board passengers at one of 15 docks, then continue down the 37th St. side into the tunnel, or, if empty, into the basement garage.

The first two bus docks are used only for unloading, the remainder for loading. Peak hour bus movements will reach a maximum of 100 departures and 90 arrivals.

When a passenger checks in at a counter, his baggage is taken by an agent and shoved through an opening in the back wall into a room where it is placed on carts for transportation to the correct bus. Some airlines are using endless belt or roller-type conveyors from the baggage scales into the back room.

Foreign flag lines on the upper concourse place bags on an endless belt which runs to baggage rooms at either end of the counter space. From there it is taken down by elevator to the bus.

In the main rotunda, which is decorated in blue-green with Chinese red pillars, 10 double wooden benches provide seating space (economy and easier maintenance dictated the use of wood). On this floor are an information booth, newsstand, restaurant seating 114 people, cocktail lounge seating 22 plus standing space at the bar, and a gift shop.

The snack bar, accommodating 54, is on the lower floor. The roof-top parking area, available to the general public, will hold 300 cars, and 100 more can be handled in the basement.

Bus time to LaGuardia and International is 22 and 33 minutes, respectively, or about five minutes shorter than from the former Airlines Terminal. The crosstown Newark trip takes longer. Buses make no stops on their way in from airports—compared to the former system under which a passenger had his option of several stops on the way in from LaGuardia.

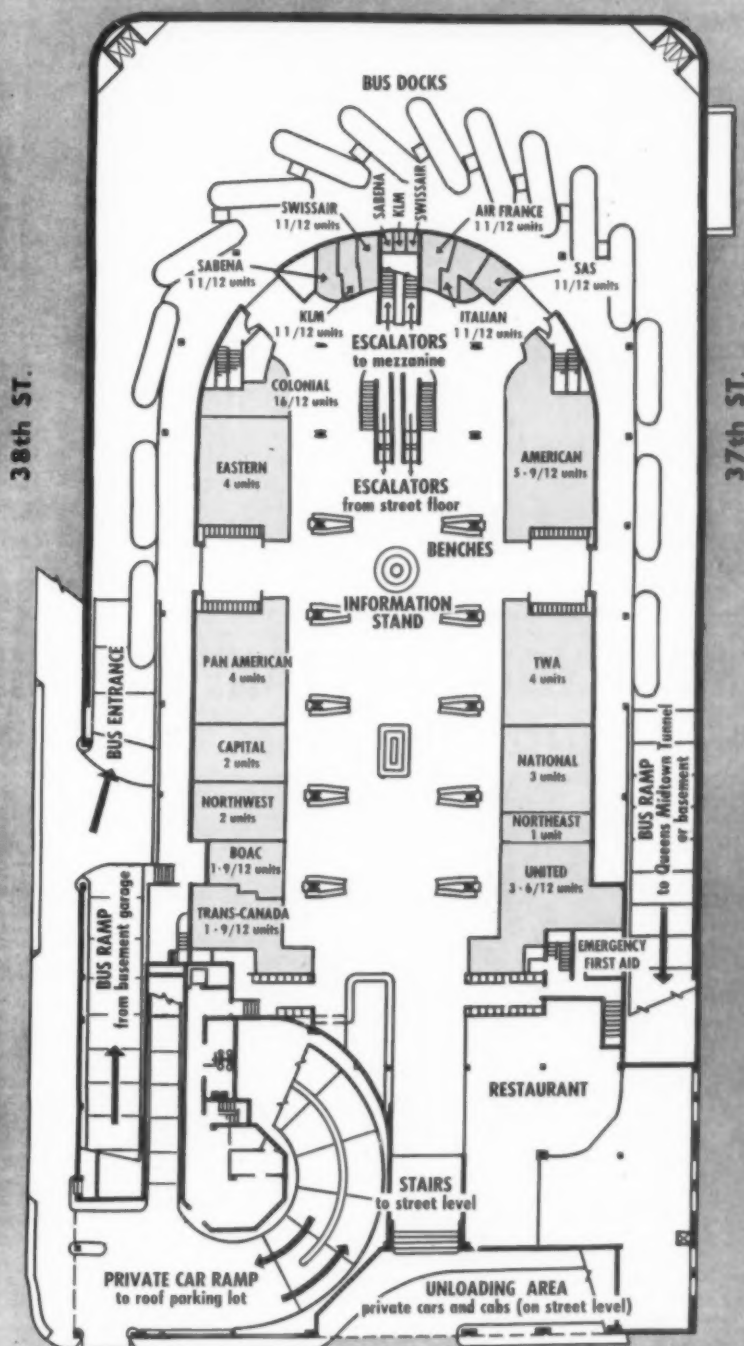
One note of dissatisfaction with the new terminal has been the amount and location of space allotted to the European and South American carriers. Some of these lines object strongly to the upper concourse, feeling that it is inferior space (for which they pay more than do U. S. carriers) and is too cramped. The same objection applies to the location and amount of main floor space.

In the lobby, only BOAC and Trans-Canada have their own counters, each of which is slightly less than 16 ft. long (American's is the longest 51¼ feet). SAS, Air France and LAI share 24¼ feet, as do SABENA, KLM, and Swissair. El Al and LAV are on the upper concourse only; TCA is main floor only.

With operations split between two

EAST SIDE AIRLINES TERMINAL TERMINAL FLOOR

FIRST AVE.



floors, the carriers are expected to ticket in the lobby and check in on the upper floor. In rush periods, however, both may be used for check-in.

Terminal corporation spokesmen claim they have made the best arrangement that was possible for these carriers, and point out that the upper concourse was added to the building especially for them. They believe that after these lines have had experience handling passengers they will be reasonably satisfied.

The terminal and land are owned by New York's Triborough Bridge and Tunnel Authority. The East Side Airlines Terminal Corporation, owned by the 10 U. S. lines, leases, operates and maintains the terminal for 20 years and must guarantee Triborough against all losses. American, Eastern, Pan American, TWA, and United each own 15% of the corporation stock; Capital, Colonial, National, Northeast and Northwest each hold 5%.

Paul Brattain, vice president of EAL, is president of the corporation. Robert Tuttle, formerly with American, is general manager of the terminal.

Foreign flag lines are not stockholders; they have 10-year leases with a five-year cancellation clause. Inasmuch as stockholders must guarantee losses, foreign lines pay more for their space—a ratio of 1½ to 1.

U. S. members of the corporation pay \$3,300 per year for each unit (9 feet) of counter space and \$3.58 per square foot for office space. Foreign lines pay \$4,950 for counters; they do not have offices in the building.

The 10 stockholders who are obligated to make up any deficit will contribute in proportion to the amount of ticket counter space they use.

In the first year's operation, the corporation will pay Triborough about \$335,000 for debt service, for Triborough's administrative overhead, and "in lieu of taxes." In addition, maintenance and cleaning will cost \$150,000, utilities \$87,000 and general and administration \$80,000, for a grand total of \$652,000. (In future years payments to Triborough increase, reaching \$450,000 in the 20th year).

Non-airline revenues to help cover the \$652,000 include: Carey Transportation Company's basement bus space, \$120,000 yearly; a "head charge" on all bus passengers, collected from Carey, \$75,000; roof parking area, a minimum of \$40,000; restaurant, bar, newsstand, gift shop and vending machines, figured conservatively at a minimum of \$60,000; minor concessions, \$40,000.

In addition to the first-year total of \$652,000, the airlines will pay about \$325,000 for the skycap service, public

address system, baggage handling, and information counter. Of this expense, 20% will be divided equally, 40% will be based on the number of airplane departures, and 40% on the number of bus passengers each airline has.

Carey, in addition to operating all buses (basement space includes complete overhaul and maintenance facilities for the 100-bus fleet) will handle baggage and the central public address system.

From Carey's operations headquarters, which controls all bus movements, a TelAutograph system extends to each airline counter. This machine informs each airline—in writing on a moving tape—to which bus dock passengers are to be sent for the next departure. Same information goes to baggage rooms, information and paging desk. Announcements are then made on the public address system.

One of the biggest concessionaires in the building is Hamburg Heaven Inc., which will operate the restaurant, bar, snack bar, gift and flower shop, and newsstand.

On the upper concourse, in addition to foreign carriers, is office space into which three airlines (United, Capital, and Northwest) are moving their New York reservations headquarters. Also renting space are American, TWA, NAL, PAA, EAL, and Colonial. •••

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Under new procurement policies aircraft manufacturers are faced with military requirements for ski-wheel equipment. Federal Aircraft has over 25 years of experience in this specialized field. Contact Federal for experienced engineering services in connection with correct ski design and proto-type or production requirements.

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What JACK & HEINTZ *is doing about...*



J&H announces development of three new 8000-rpm, continuous-duty, d-c generators for jet aircraft—unique “straight-through” air path design provides maximum cooling.

High-speed accessory pads on current jet engines create the need for a generator which can operate continuously and efficiently at 8000 rpm. Present generators, designed primarily for use on reciprocating engines, do not meet that demand—high temperatures and stresses greatly reduce service life of bearings, commutators, brushes and insulation—making new generator developments a vital necessity.

Responding to this need, and nearing production on three models, J&H is the first manufacturer to announce development of essential high-speed, d-c generators for use with jet aircraft engines. All models are “true” 8000-rpm, continuous-duty, d-c generators.

J&H engineers, in developing the new units, have refined conventional aircraft generator design to include:

1. Elements capable of withstanding higher operating temperatures
2. Greater heat transfer areas to reduce heat flow resistance
3. Design changes to reduce heat losses

Maximum cooling is provided through one of the most unique features of the new units, a “straight-through” air path that allows free air passage under the commutator and through the armature.

Specially designed blast caps are available to meet specific airframe requirements or to effect reduction in over-all generator dimensions.

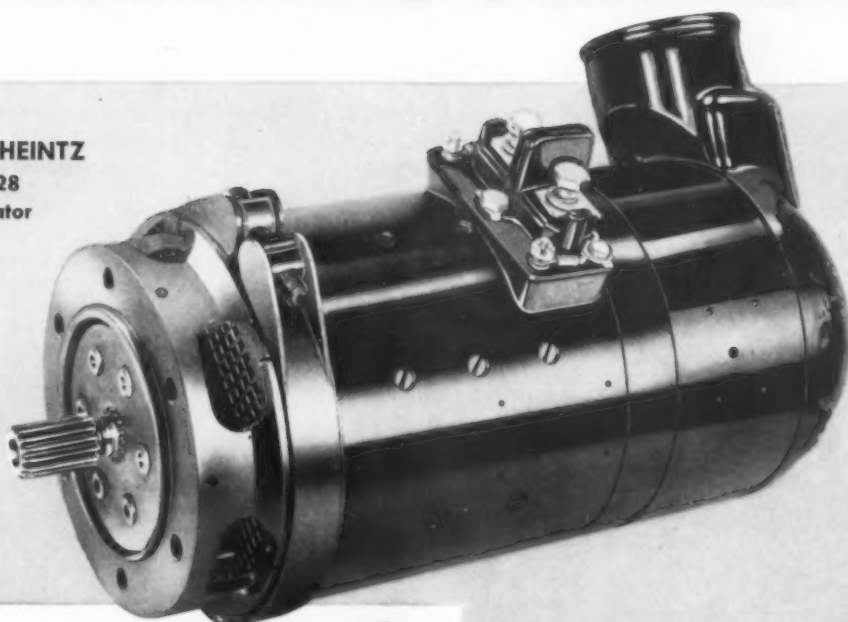
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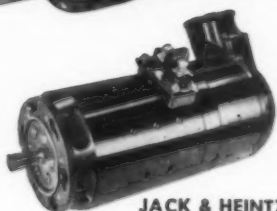
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GENERATORS FOR JETS

JACK & HEINTZ
Model G128
d-c Generator



JACK & HEINTZ
Model G124
d-c Generator



JACK & HEINTZ
Model G123
d-c Generator

DESCRIPTION	MODEL G123	MODEL G124	MODEL G128
Basic specifications*	MIL-G-6162	MIL-G-6162	MIL-G-6162
Ampere rating at 30 v	300	400	400
Speed range (rpm)	3000-8000	3000-8000	3100-8000
Cooling air pressure (in. of water)	6	6	12
Engine mounting pad	AND-20002	AND-20006	AND-20002†
Length (in.)	13¾	13½	14¾
Diameter (in.)	6½	8	6½
Weight (lb)	64	81	68
Overhung moment (in.-lb)	360	430	450

†Equipped with Quick-Attach-Detach mounting flange.

J&H looks to the Future

In addition to the d-c generators described, several new a-c generators will be available soon. This group of alternators includes:

G181-1—a 30-kva, 4800 to 7200-rpm air-cooled unit

G281—a 40-kva, 6000-rpm air-cooled unit

G186—a thermal-lag unit with a magnetic amplifier regulator

G190—an oil-cooled unit

G180—an air-cooled 6000-rpm unit developing 120 kva with air pressure of 6" water, 160 kva with 12" water.

J&H engineers will be glad to work with you in developing aircraft electrical, mechanical or hydraulic devices to meet your special requirements. Write Jack & Heintz, Inc., 17633 Broadway, Cleveland 1, Ohio.

*Military specification numbers as used herein are for purposes of product identification only and do not necessarily imply specification conformity.

Rotomotive



EQUIPMENT

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Aircraft Generating Equipment—a-c and d-c—including Control Systems and Components • Electric Starters • Actuators and Special Aircraft Motors • Custom-built Commercial Motors • J&H Eisemann Magnetos

DECEMBER 7, 1953

43



NEW YORK AIRWAYS helicopter hovers over crowded ramp after take-off at Idlewild. Copters have been forced to load out away from terminal.

N. Y. Airways Tallies Year's Experience

One thousand passengers and 280,000 revenue-miles leave helicopter line planning expansion.

By WALTER A. KILRAIN

AT THE MARINE TERMINAL on LaGuardia Field, a 40¢ taxi ride from the main terminal building, a half dozen offices form the headquarters of New York Airways. From those



Cummings

offices recently came the news that thereafter United Air Lines would handle ticketing and baggage for NYA, as well as giving counter space to its advertising. A short time before that the helicopter operator had marked its first anniversary in mid-October with a spate of statistics on its achievements to date and the promise by its president, Robert L. Cummings, that 'copter service to downtown Manhattan was on the way.

The arrangement with UAL promises to solve what had been one of the carrier's biggest problems during its first year of operation: getting together with the public.

The first-year statistics showed how well it had managed to solve some of its other problems. From October 15, 1952, to October 14, 1953, New York Airways:

- Flew over 281,000 revenue-miles in 4700 hours, an average of $4\frac{1}{2}$ revenue-hours per scheduled day per plane. (Figured on calendar days, the average fell to $3\frac{3}{4}$ revenue-hours per plane.)

- Carried almost 109 million pieces of mail (over three million pounds), almost 1000 passengers (passenger service started on June 8, 1953), and 102,000 pounds of cargo. Passenger-mile total stood at 15,900 as the first year ended.

- Hauled seven charter jobs a total of 17 hours at \$200 per hour.

By the year's end NYA was flying its five Sikorsky S-55's a monthly total of some 35,000 miles between New York's three big airports, along two routes up into New York and New England and down into New Jersey as far as Trenton.

The achievements of the first year had not been rolled up without difficulties to match them:

- Passengers had a hard time finding the carrier, which could not yet afford counter space at the terminals, and had to report to the office of a



MAP of New York Airways routes, as they stood at the end of first year.

limousine service in order to make themselves known to NYA;

- Crowded ramps and the big rotors of the S-55's led the carrier to land and load its 'copters some distance out from the terminal building. Passengers at LaGuardia were driven out and back in a station wagon. At Newark a passenger connecting with an American Airlines flight leaving from the far end of the arcade might find himself faced with a nine-minute walk after a 20-minute helicopter ride.

- Uncertainties of mail load played hob with load factors. NYA did not know how much weight would have to go for mail until 15 minutes before flight time. Firm reservations for most of the seats in the seven-passenger S-55's became impossible, although two seats were always available.

- Weather clamped the lid on all operations.

- Low hanging clouds bouncing back sound waves brought complaints from increasingly vocal residents near and between the N.Y. airports to the effect that NYA's helicopters, not the quietest of aircraft under normal conditions, were flying at 100 and 200 feet. Actually the flight plans keep the S-55's at 500 or 1000 feet most of the time.

Whether the achievements or the difficulties should loom larger in an assessing of NYA's first year of operations is still a moot point. The mail pay, at the standard helicopter rate of \$2.58 per ton-mile, is open to revision, so that a firm estimate of profit and loss is still impossible to establish.

What is certain is the increased knowledge of the helicopter that New York Airways has accumulated.

In maintenance such experience has raised the overhaul time on the Pratt & Whitney R-2800 engines from 300 hours to 700 hours. The S-55's have averaged 5.4 maintenance hours per flight hour, with most of the time put in on the airframes, grease jobs predominating. NYA has learned to treat the magnesium skin of the helicopters with care, giving it close inspections for cracks and corrosion and drilling holes with caution in order to avoid starting cracks. Several input housing failures occurred, but very little trouble was experienced with the blades.

The helicopters are inspected as follows:

Daily	12 man-hours
Intermediate	
(30 hours)	32 man-hours
120 hours	100 man hours
	(exclusive of component changes)

The maintenance staff that handled this work-load has included 26 men, including 22 mechanics, 1 radio specialist,

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and 3 supervisors. The rest of the staff consists of 10 pilots (including the chief of operations), 2 or 3 cargo handlers, 3 flight attendants, and 4 dispatchers.

NYA has also had occasion to learn something about passenger reactions to helicopter travel. Judging from the replies to 245 questionnaires that were distributed (118 were filled out and returned), the passengers during the carrier's first year found the staff courteous, found the helicopters noisy, and found New York Airways only with some difficulty.

Of those who mailed back the questionnaires, 52 were traveling for business, 54 for pleasure; 47 made appointments that would otherwise have been impossible; 107 enjoyed the flight and 2 didn't; and 49 were making connections with another airline.

Though the passenger loads on NYA have been relatively small, cargo has played a considerable part in the operation. Company material for the airlines flying out of the three airports makes up an average of 10 or 11 shipments daily, about 40% of the total cargo traffic. Another 40% of the load is accounted for by through-moving freight shuttled between the airports. In this operation New York Airways functions as a trucker for airline members of Air Cargo Inc.

The remaining 20% is common carriage, in which NYA itself acts as an ACI shipper. The loads in this category include three or four shipments of blood each week that move from LaGuardia to Newark by NYA, then complete the trip to West Orange, N. J., by cab; parts for Sikorsky in Bridgeport, Conn.; paper samples for the *Readers Digest* in Pleasantville, N. Y.; and baby chicks which are hustled from farms in the New York and Connecticut area to Idlewild for shipment to South America.

Elapsed time in this case from origin to final destination must be under 72 hours, since the chicks are not fed while they are en route. The speed of helicopter service consequently weighs heavily. Truck shipments between LaGuardia and Idlewild may take from 24 to 48 hours or more.

Future of NYA will be determined to a large extent by what the CAB has to say about its mail pay and its routes. The carrier would like to increase its present monthly 35,000 miles to 39,000, extending its routes out into Long Island and northwest into New Jersey. It would also like to find a navigation system that would enable it to keep operating in instrument weather.

If either of these hoped for eventualities should come to pass in the next few months, NYA may have a record for its second year of operations that will compare favorably with its first. . . .

NEW! STARTS DEC. 15

WESTERN ANNOUNCES ITS

AIR COACH

ON THE DIRECT ROUTE BETWEEN

MINNEAPOLIS

ST. PAUL

AND

LOS ANGELES

BIG 4-ENGINE \$79⁰⁰
COACHMASTERS PLUS TAX

Now you can take your choice
of Western's thrifty Air Coach or deluxe DC-6B!

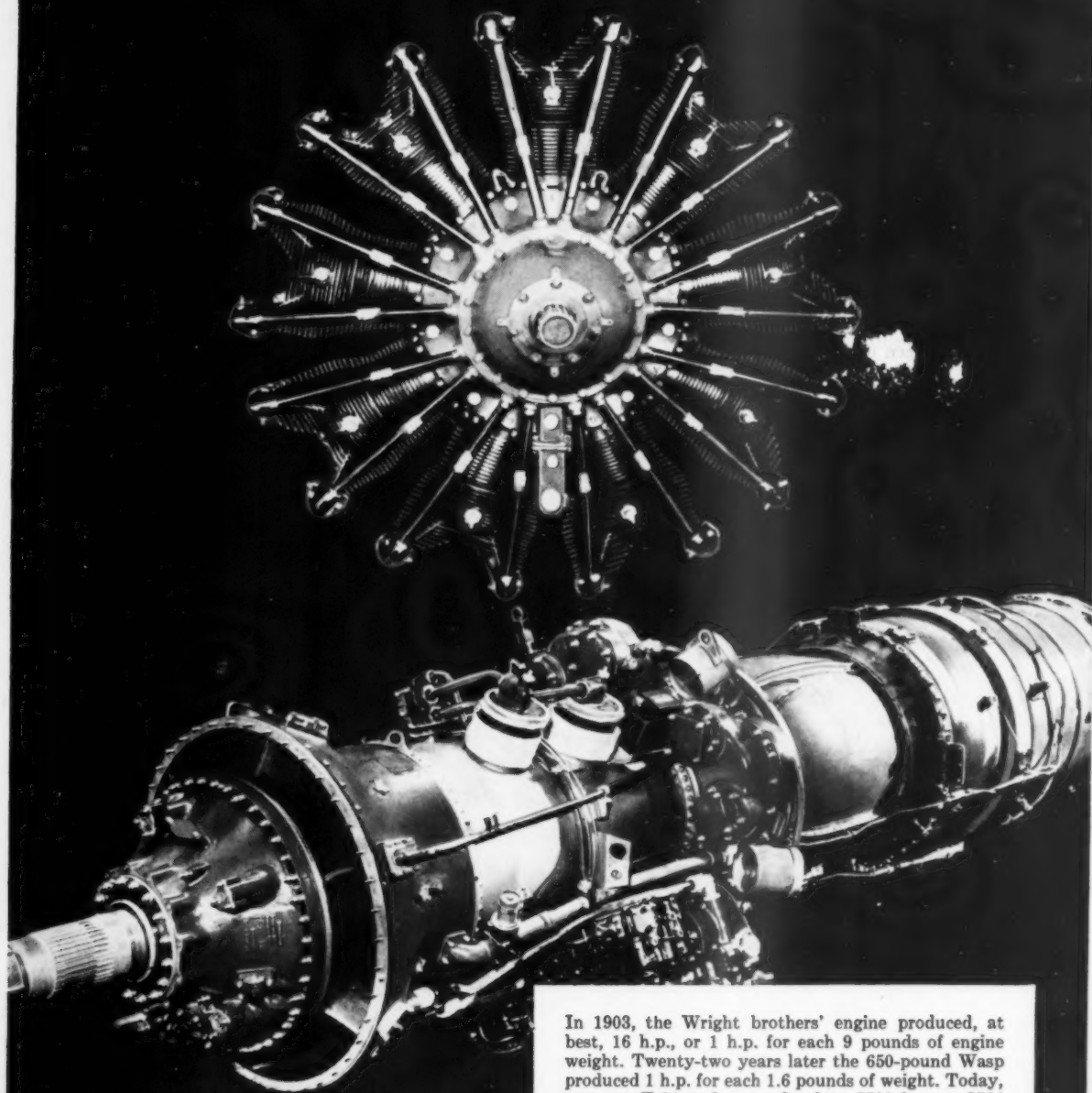
	DC-6B	COACH	WESTBOUND	DC-6B	COACH
EASTBOUND					
Lv Los Angeles	9:30 pm	11:10 am	Lv Minn.-St. Paul	9:00 am	11:00 pm
Ar Minn.-St. Paul	6:15 am	9:30 pm	Ar Los Angeles	2:30 pm	6:00 am

WESTERN AIR LINES

AMERICA'S OLDEST AIRLINE



~~50~~²⁸ YEARS



In 1903, the Wright brothers' engine produced, at best, 16 h.p., or 1 h.p. for each 9 pounds of engine weight. Twenty-two years later the 650-pound Wasp produced 1 h.p. for each 1.6 pounds of weight. Today, our new T-34 turboprop develops 5700 h.p. at 2564 pounds, or 1 h.p. for less than $\frac{1}{2}$ pound of weight. And the J-57, not illustrated above, is even more powerful.

S OF POWERED FLIGHT!

*From horsepower to thrust, power plant developments
are the measure of air progress*

THIS YEAR the entire world is celebrating the 50th Anniversary of Powered Flight and the tremendous progress that has been made in that half-century.

The engine is the heart of the airplane, and for 28 of those 50 years, Pratt & Whitney Aircraft has been a leader in the manufacture of the world's best aircraft power plants. From 1925 to the present day, generations of civilian and military aircraft have been built around Pratt & Whitney power plants. In World War II almost 50 per cent of the aviation horsepower used by the Allies was provided by Pratt & Whitney Aircraft engines. Today our engines power over 75 per cent of the world's 4000 commercial airliners, and are a major factor in military aviation.

But building engines today has become an increasingly difficult task.

Our first engine, the 410 h.p. Wasp, was designed and built by 26 men in a mere seven months. It was engineered in a 2-car garage, and made in a shop that had once been a tobacco warehouse.

By contrast, development and production of today's most powerful engine, the J-57, required millions of engineering manhours . . . and much of Pratt & Whitney's 6,000,000 square feet of floor space. Thousands of special skills and more than 20,000 special tools are required to produce it.

Between the Wasp and the J-57 lies much of the history of aviation. And from this history many important lessons have been learned, not the least of which is this: America's security demands consistent development and production of better and more powerful aircraft engines.

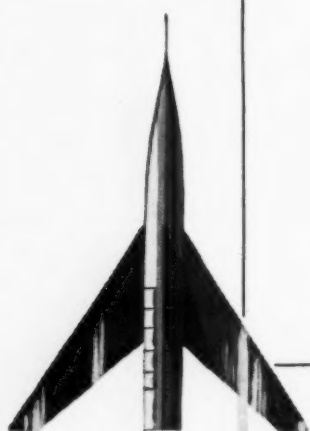
Pratt & Whitney Aircraft

MAIN OFFICE AND PLANT: EAST HARTFORD, CONNECTICUT

BRANCH PLANTS: NORTH HAVEN, SOUTHINGTON, MERIDEN

ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION





new instrumentation discovery!



This is the story!

Yesterday

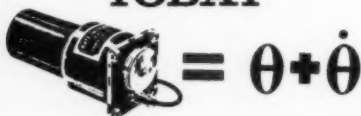


Directional
Gyro
Torquer
Cage
Pickoff

Rate Gyro
Pickoff
Damper

Mixing
Circuitry

TODAY



	Reliability	Drift	Current	Weight	Cost
yesterday	.950	5/Min	3 amps	12 lbs.	
today	.999	.1/Min	.3 amps	3 lbs.	

This new invention, Summers Model 188, for the first time makes available on a single pickoff the algebraic sum of both the *displacement* and *rate of displacement* of air or water craft. This simple pickoff is the on-off type, and is easily linked mechanically to the control surface actuator. Or Model 188 may be supplied with either an inductive or potentiometer pickoff where mechanical follow-up is not practical. Parameters are easily adjustable over a wide range to attain stability with ease.

Heretofore, even an entire series of costly instruments failed to insure this goal with equal reliability.

Both weight and cost of the Model 188 are about one-fourth of the weight and cost of the apparatus it obsoletes.

Now available in production quantities.

SUMMERS GYROSCOPE

C O M P A N Y
2328 BROADWAY • SANTA MONICA, CALIFORNIA

DC-7 Performance (Based on T.S. 1299A)

	Gross Weight 102,000 lbs.	Gross Weight 110,000 lbs.
Maximum level flight speed		
With Rated Power	406 mph	401 mph
Altitude	22,100 ft.	22,000 ft.
Level Flight Speed with Max.		
Cruising power	361 mph	350 mph
Altitude	24,300 ft.	24,100 ft.
Stalling speed in landing configuration at maximum landing weight	99 mph	
Rate of climb and ceiling with rated power		
Four eng. max. R/C at sea level	1,615 ft./min.	1,415 ft./min.
Four eng. max. R/C at 20,000 ft.	870 ft./min.	690 ft./min.
Altitude at which 4 eng. R/C equals 6Vso	22,300 ft.	20,400 ft.
Altitude at which 3 eng. R/C equals .04Vso ²	19,050 ft.	13,400 ft.
Take-off with T-O power		
CAA field length at sea level	3,780 ft.	4,560 ft.
CAA field length at sea level-Max. T-O weight	6,350 ft.	
Landing		
CAA field length at sea level	5,870 ft.	

Panagra, a U.S. carrier operating foreign routes, has ordered DC-7's, but, at this writing, hasn't decided on the configuration which would best suit its Latin American and South American routes. Panagra representatives were in Santa Monica earlier this month consulting with Douglas on this subject.

Pan American World Airways is showing interest in the overwater DC-7. Juan Trippe, PAA's president, accompanied by vice president Gledhill and Charles A. Lindbergh, who is a technical consultant to the carrier, were in Santa Monica recently to check over the fast Douglas transport.

In addition to the multiple competition it encounters from a variety of carriers in the Atlantic, PAA will go up against direct DC-7 competition next year when United Air Lines puts its new planes on its Honolulu route. UAL's Turbo-Compounds will fly the route an hour and a half faster than PAA's Boeing Stratocruiser schedules.

DC-7's standard overwater interior is for 58 passengers. This interior configuration includes forward and aft main cabins separated by a lounge amidship. A stateroom is forward. In the domestic DC-7 the lounge is aft.

The number of lavatories is increased to four, two placed aft in the tail and two placed forward between the forward main cabin and the stateroom.

An alternate interior is a 58-passenger dayplane or 55-passenger combination sleeper. This configuration puts 38 sit-up seats in the forward main cabin while the aft cabin has accommodations for 16 passengers in seats, or four passengers in seats and 10 passengers in four upper and three lower berths. Stateroom in front has accommodations for four passengers in seats or three passengers in berths.

High-density interior will seat 88 passengers in a two-and-three seating configuration.

Flight deck modifications include addition of stations for navigator and radio operator, and a crew rest area.

Douglas cites the following sample scheduled flight times:

New York-London	10 hours 4 minutes
Shannon-New York	10 hours 44 minutes
Honolulu-San Francisco	7 hours 8 minutes
Tokyo-Honolulu	12 hours 29 minutes
Hong Kong-Toyko	5 hours 18 minutes
Singapore-Darwin	6 hours 18 minutes
Miami-Port of Spain	4 hours 50 minutes
Port of Spain-Rio de Janeiro	8 hours 7 minutes
Natal-Dakar	5 hours 50 minutes
Rome-Leopoldville	9 hours 36 minutes
Cairo-Karachi	6 hours 38 minutes
London-Rome	2 hours 58 minutes
New York-Miami	3 hours 20 minutes
New York-Chicago	2 hours 31 minutes
Los Angeles-New York	7 hours 14 minutes

Douglas Pushes Long Range DC-7 Sales

Gross weight of overwater version upped to 125,000 pounds, fuel capacity to 6260 gallons.

By FRED S. HUNTER

THE Douglas Aircraft Co. is moving into the international field with its DC-7.

It is now offering an overwater version which will operate on a 10 hour 4 minute nonstop schedule over the eastbound North Atlantic route from New York to London. Coming this way, it will fly from Shannon, Ireland, nonstop to New York in 10 hours 44 minutes.

The overwater DC-7 will have a maximum gross take-off weight of 125,000 pounds as compared with the highest domestic gross of 122,200 pounds.

The fuel capacity is increased from a maximum of 5512 to 6260 U.S. gallons.

Despite the fact that in the DC-7 it had the fastest propeller-driven transport in this country, the Douglas international pitch heretofore has been with the DC-6B, a plane of superior range economies and selling at a thriftier price: approximately \$1,100,000 as compared with \$1,600,000 for the DC-7.

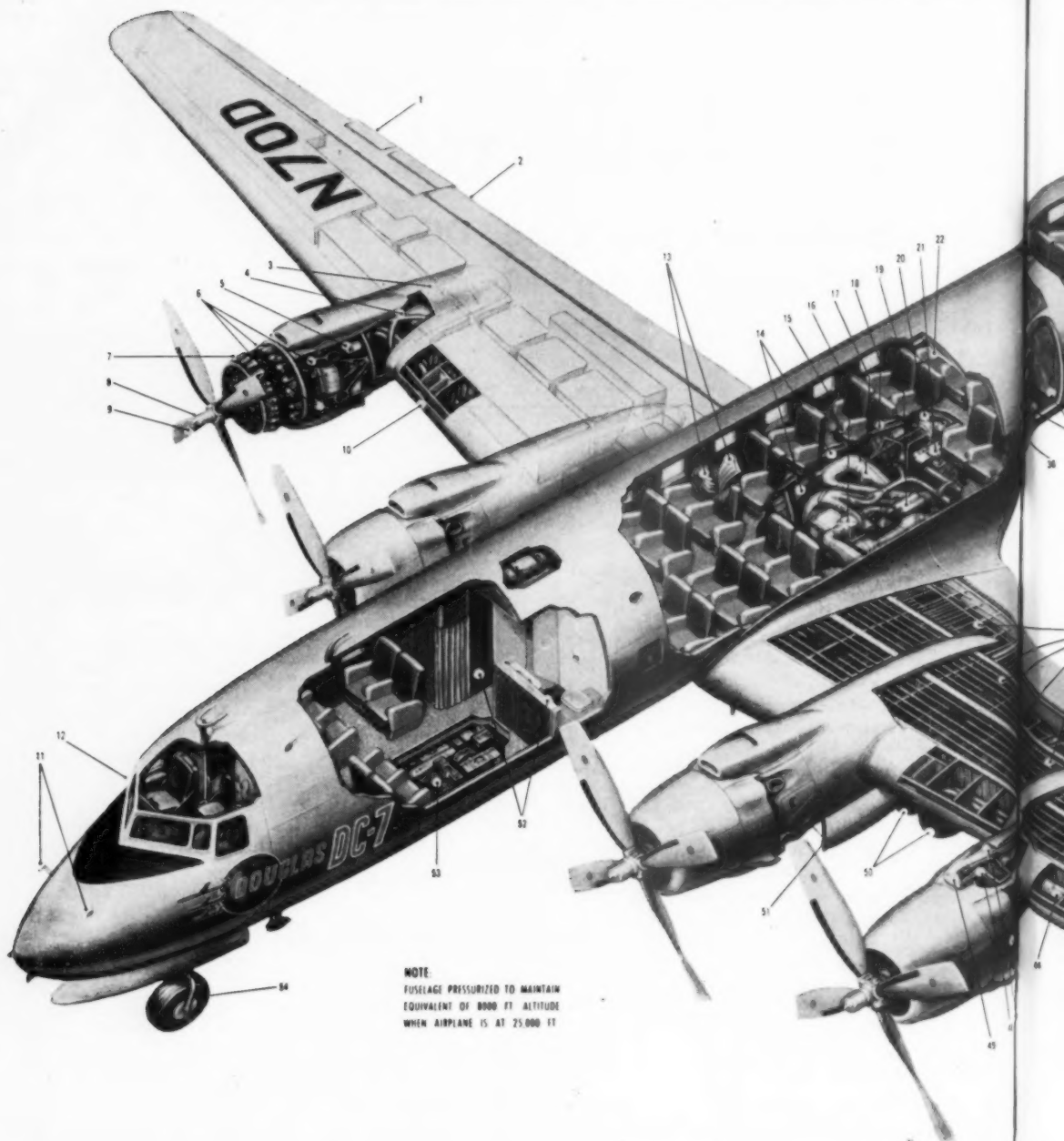
Domestic operators like American, Delta, National, and United were willing to pay the premium for the DC-7's faster speed, but overseas carriers—with one eye cocked toward the Comet—were more interested in the DC-6B economies.

Flight Profile and Overwater Performance

Flight Profile for 1500 Statute Mile Range		Landing weight	94,617 lbs.
		Required landing field length	5,485 ft.
Operating weight empty	72,561 lbs.	Performance Data on the Overwater DC-7	
Payload	15,880 lbs.		
Block fuel	14,900 lbs.	Maximum take-off weight	125,000 lbs.
Reserve fuel	5,050 lbs.	Maximum landing weight	102,000 lbs.
(Reserve range is 500 st. mi. plus one hour holding.)		Maximum zero fuel weight	96,000 lbs.
Block time	4 hours 35 minutes	Fuel capacity	6,250 gallons
Take-off field length	4,896 ft.	Power plant	Wright R-3350 Compound
Take-off weight	109,517 lbs.	Propeller	Hamilton Standard four-bladed high-activity aluminum (Diameter-13 ft. 6 in.)
Climb to 23,500 feet			
Time to climb	32 minutes		
Climb distance	130 st.mi.		
Cabin rate of climb	244 ft./min.		
Cruise at 23,500 feet			
BHP/Eng.	1,800		
Average cruise speed	360 mph		
Cabin altitude	7,800 ft.		

DOUGLAS DC-7

Cutaway view of the new Douglas DC-7 in typical domestic configuration. Overwater interior has lounge amidships instead of aft and has four lavatories.



NOTE
FUSELAGE PRESSURIZED TO MAINTAIN
EQUIVALENT OF 8000 FT ALTITUDE
WHEN AIRPLANE IS AT 25,000 FT



- 1 DUAL AILERON SPRING TABS
- 2 DOUBLE SLOTTED FLAP
- 3 TITANIUM NACELLES FIREWALL AND ATT
- 4 R. H. CABIN SUPERCHARGER DUCT TO CABIN
- 5 LARGE 46 GAL USABLE OIL TANK
- 6 THREE EXHAUST BLOW DOWN TURBINES
- 7 WRIGHT AERONAUTICAL DIVISION MODEL R3350 18 CYLINDER ENGINE
- 8 HAMILTON STANDARD MODEL 3440 13 1/4 FT DIA FOUR BLADE HYDROMATIC PROPELLER
- 9 ELECTRICALLY HEATED PROPELLER DE ICING BOOTS
- 10 R. H. CABIN SUPERCHARGER AND WING HEATER PLENUM TYPE AIR INLET
- 11 PILOT WASTES
- 12 LARGE DC 6 TYPE COCKPIT
- 13 3 1/4 INCH THICK FIBERGLAS BLANKETS FOR SOUNDPROOFING
- 14 FREON COOLING SYSTEM INLET AND CONDENSER
- 15 HEATED PANEL FOR WARM WALL AND FLOOR
- 16 AFTER COOLER AND EXPANSION TURBINE
- 17 300,000 BTU HR CABIN HEATER
- 18 ALCOHOL TANK IN R. H. WING FILLET
- 19 CABIN AIR MIXING VALVE
- 20 FREON SYSTEM COMPRESSOR
- 21 CABIN CONDITIONED AIR SUPPLY DUCT TO FLOOR AND WALL DISTRIBUTION PANELS
- 22 INDIRECT OVERHEAD LIGHTING
- 23 RUDDER SPRING AND TRIM TAB
- 24 FABRIC COVERED RUDDER AND TAB
- 25 LANDING FLARES IN TAIL CONE
- 26 ELEVATOR SPRING TABS
- 27 ELEVATOR TRIM TABS
- 28 METAL COVERED ELEVATORS AND TABS

- 29 STABILIZER AND FIN LEADING EDGES HEATED FOR ICE ELIMINATION
- 30 TAIL ANTI ICING AIR INLET
- 31 TAIL HEATER AND ANTI ICING DUCTS
- 32 FIVE PLACE LOUNGE
- 33 MAIN AND ATT PASSENGER CABIN 72 FT LONG
- 34 ATT LOWER BAGGAGE AND CARGO COMPARTMENT
- 35 GALLEY AND FOOD SERVICE EACH SIDE PASSENGER ENTRY WAY
- 36 MAIN PASSENGER ENTRANCE DOOR 36" x 72"
- 37 CENTER WING FUEL CAPACITY VARIES BETWEEN 3122 AND 4122 GAL DEPENDING UPON THE INSTALLATION OF THESE CELLS
- 38 FLAP YANES
- 39 AILERON SPRING TABS
- 40 AILERON TRIM TABS
- 41 METAL COVERED AILERON AND TABS
- 42 OUTER WING PANEL FUEL 495 GAL
- 43 WING HOT AIR DISTRIBUTION DUCT
- 44 L. H. WING 300,000 BTU HR ANTI ICING HEATER
- 45 STEEL ACCESSORY COWLING
- 46 FOUR LARGE COWL FLAPS PER ENGINE
- 47 ALTERNATE RAM FOR AVERAGE ICING
- 48 PREHEAT FOR SEVERE ICING
- 49 NORMAL RAM
- 50 15 50 x 20 MAIN GEAR TIRE 24 PLY RATING
- 51 MAIN LANDING GEAR DOORS, LINKS AND STRUCTURE ACT AS A SPEED BRAKE CAN BE LOWERED AT SPEEDS UP TO 300 MPH TIAS
- 52 TWO COMPLETE LAVATORIES
- 53 FORWARD LOWER CARGO AND BAGGAGE COMPARTMENT
- 54 SINGLE 44 INCH NOSE GEAR TIRE



IN-FLIGHT REFUELING enables the B-47 to fly more than 12,000 miles non-stop. A vital factor in establishing rendezvous points is fuel consumption rate, measured on the B-47 by the G-E mass flowmeter.

Radically New G-E Fuel Flowmeter Gives True Mass Readings in Pounds per Hour

Jet engine fuel consumption can now be measured accurately at all operational altitudes and temperatures. A new kind of flowmeter, developed by General Electric, gives direct pounds-per-hour readings that are accurate regardless of density variations.

By measuring the mass of fuel consumed this revolutionary flowmeter averts the error factor inherent in earlier systems. It is the first true mass flowmeter in large-scale production.

In use on the B-47 Stratojet, the G-E mass flowmeter is proving its value as a cruise control instrument. The unusually long-range missions flown by the B-47 require utmost dependability in the indication of fuel consumption rate. The mass flow-

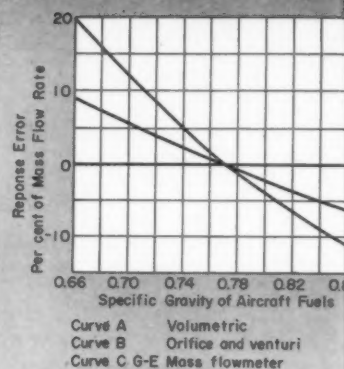
meter also assures precise setting of fuel flow in starting engines, thereby helping to prevent overheating.

A complete mass flowmeter system has three lightweight components—indicator, transmitter, and a shock-mounted power supply. One power unit can supply as many as eight transmitters. Pressure drop in the transmitter is very slight, making possible two important advantages: (1) no additional fuel pumping capacity is needed; (2) the transmitter can be mounted in the low-pressure section of the fuel line near the fuselage.

For more information, ask your G-E Aviation Specialist for Bulletin GEC-932. Or write to Section 210-82, General Electric Company, Schenectady 5, New York.

You can put your confidence in—

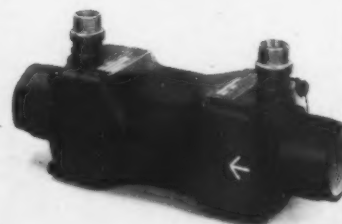
GENERAL  ELECTRIC



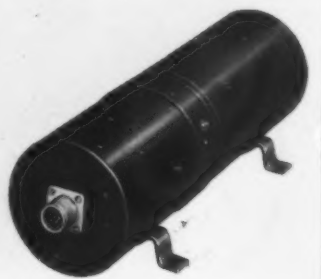
1. FUNDAMENTAL RESPONSE errors of the other two main types of flowmeter are contrasted with accurate response of G-E mass flowmeter.



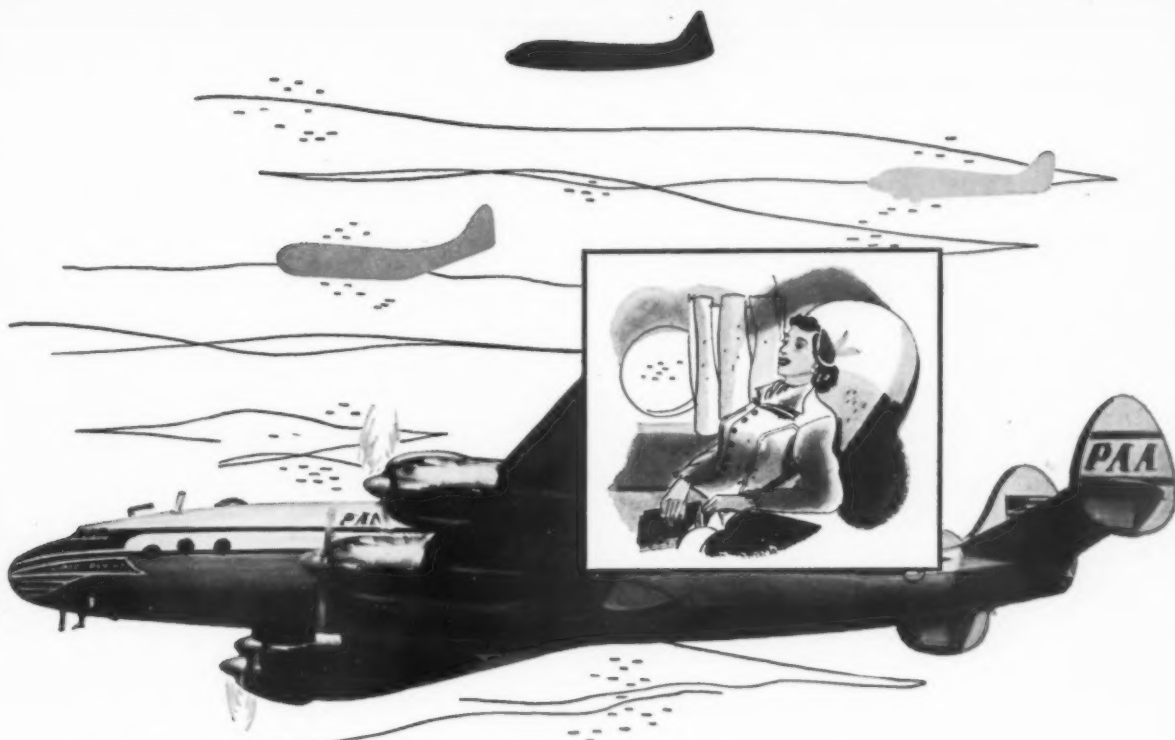
2. INDICATOR has easy-to-read expanded scale that shows rate of fuel consumption in pounds per hour. Maximum weight: 0.6 lb.



3. TRANSMITTER gives readings up to 12,000 pph of mass flow. It will withstand 200 psi pressure. Maximum weight: 5.5 lb.



4. POWER SUPPLY has a 28-v constant-speed motor. Filters keep radio noises within Spec. MIL-1-6181. Maximum weight: 5.0 lb.



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To give passengers cool comfort in hot summer weather, forward-looking airlines are modernizing their cabin pressurization and air conditioning equipment by installing Stratos high capacity cabin superchargers and refrigeration units.

Capable of handling the requirements of high density aircraft, Stratos units are replacing older equipment in Constellations and Convairs and have been ordered in quantity by the Air Force.

Stratos superchargers and air cycle units assure the airline operator the most for his air conditioning dollar. They have established outstanding service records. The highly efficient Model B-60 Bootstrap cooling unit illustrated below, for example, has a specified overhaul period of 2500 hours.



MODEL B-60 REFRIGERATION UNIT

Axial flow turbine • Rated
Flow 62 lbs./min. • Discharge
temperature, approximately
0°F. on 100° day



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Air Moisture Separators • Mass Flow Valves • Emergency Disconnects

The Air Force Strategic Bombing Mission

UPON DECISIONS already made and upon others still in the discussion stage in the Pentagon rests the fate of this nation. How wise these decisions are, or how mistaken they may be, will not be known until they meet the test of war. Always unknown with any measure of certainty are the preparations and the planning of a possible enemy.

It used to be said that the next war always starts with the weapons left over from the last war; and only as the war progressed would new weapons be introduced. That was true of World Wars I and II. It will not be true, except to a very limited extent, for the next global war.

That is because the war, probably from its inception, will be fought with weapons that came into being only toward the end of World War II and that had only limited use. These weapons are the guided missiles, the atomic and hydrogen bombs, and jet aircraft.

The art of waging war does not progress through a process of evolution, with the weapons gradually growing more effective or more powerful. Rather, the art or science of mass killing progresses through a series of revolutions. The use of gun powder and the rifle was such a revolution; the substitution of steam for sail was another; yet another was the armored steel warship, stemming from the wooden-hulled ironclads of the American Civil War.

The birth of the airplane marked a revolution that took war into the air. Now, with the invention of the atomic and hydrogen bombs, air transported, the world is faced with a prospect of mass destruction not even remotely visualized at the beginning of World War II.

One hundred enemy bombers each carrying one hydrogen bomb, if they reached their targets, could utterly destroy 100 American cities with their populations.

That is the revolutionary fact that our defense planners must face; that is the menace they must plan to guard our nation against. In addition to this threat there is the guided atomic missile that can be transported by submarine and launched not only against our coastal cities but against many inland cities.

It may sound ironical but it is nevertheless true that the better we prepare to fight a war, the less danger there is that we will have to fight it. In all history, there is no record of one nation attacking another that it believed to be stronger than itself. No nation starts a war expecting a licking. Therefore, it would seem, the best insurance against war is adequate preparation for it.

That brings us to the question, What is adequate? How much of this war insurance do we need? How much can we afford to pay for? What is the best form of insurance?

That is what the Department of Defense is trying to ascertain, to fix upon a proper balance for our forces of land, sea and air.

The Navy stresses its mission of maintaining control of the seas, so it can convoy the men and materials of war across the oceans and also can protect the freighters bringing raw materials to us and to our allies.

This is one point upon which there is no dispute among the services—the Air Force and the Army thoroughly agree that the Navy must have the means of conducting anti-submarine warfare at sea, thus protecting the life-lines of the United States and its allies.

But the Navy also declares that one of its primary missions is supporting the land battle and conducting atomic attack on land targets from carrier task forces in the Mediterranean or in the North Sea or from other coastal waters. The air answer to this is that one hydrogen bomb can destroy an entire carrier task force with ease. To this the Navy replies with an air of conviction that its carrier-based jet fighters and its surface-to-air guided missiles and anti-aircraft artillery will provide adequate protection for its mobile air bases. To this the Air Force replies that, on land or sea, "the bombers always get through."

The Navy points out that there are some 350 Russian submarines in existence, including some of the latest German types turned over to Russia at the end of World War II. These submarines can bring guided missiles right to our front door, unless the Navy destroys the submarine fleet.

Why Super Carriers?

The Air Force contends that the Navy doesn't need super carriers and big bombers for this task, which can be performed by carriers of the Essex class, or smaller escort carriers, with the hunter-killer groups.

The carriers of the Midway class and the Forrestal class, if they attack land targets—such as submarine bases and building yards—will merely be duplicating the mission of the Strategic Air Command (SAC), which intends to kick off an atomic bomb on these same targets while crossing the coasts on their way to the heart of Soviet Russia.

There is an air power school of thought outside the Pentagon which advocates the one-weapon system—reduce the Army and Navy and build a much bigger Strategic Air Command. This adds to the confusion.

Let us try to isolate a few basic facts. In the first place, war has been defined as the extension of politics into the field of force. Politics is the power that brings the forces of war into being and dictates their employment. It is the politicians, not the military men, who lay down the rules of the game and provide the money to pay for it. The military may only inform and suggest; control rests with the politicians.

The North Atlantic Treaty Organization is a political concept by which the United States is committed to a policy of aiding European and other nations to restrict aggression. That automatically rules out the one-weapon system advocated by some civilian air enthusiasts. It well may be that blowing all Russian indus-

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Thousands of miles away, long-range Northrop F-89 Scorpions stand guard night and day along the top-of-the-world route to America's heart, defending our homes and industry • These lethal USAF defenders will "scramble" at the first flash-warning from the polar radar chain. With deadly armament, latest radar, and ability to range over a defense zone up to 2000 miles in depth, they can strike, follow, harass, and destroy an invader hours before he can reach target • The Scorpion F-89 is America's most heavily armed fighter. It is a product of the precision team of Northrop men and machines.

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The AF: Not \$40.2 billion but \$26 billion

try to rubble might be the best way of protecting Europe from Russian invasion. But could that idea be sold to a single European nation?

If we told the Europeans that we proposed to leave them to defend themselves alone, that we could not convoy supplies for their sustenance, that we could not aid them on the ground or in the air or on the seas around their coasts, we would have no allies in Europe.

They would feel—and quite rightly—that we had deserted them, that we had embraced a new form of isolation. In effect, we would be staying in our own back yard and hurling atomic bricks at the enemy.

Those who champion strategic bombing alone retort, suppose we have to stay here? What if the Russians drop atomic bombs on a dozen or more European ports and put them completely out of business? How then can we support any land and air forces in Europe?

In all of these discussions—and they go on at all levels in the Pentagon—the two matters uppermost are the atomic and hydrogen bombs, and the method of getting them above selected targets. First point to stress is that the Russian Army poses no threat to the safety of continental United States; the American Army certainly is no threat to Russia—it's too small for effective action against 175 Russian divisions.

The Russian undersea navy poses a direct threat against at least the coastal cities of the United States by the use of guided missiles; while the U.S. Navy poses practically no threat against Russian coastal cities—for there are no important cities on Russian coasts, east or west. Mention Vladivostok, Murmansk and Archangel, and that's about the lot.

Against the threat of annihilation from the air, only two forces can offer any major opposition to a Russian bombardment attack. They are the Air Defense and Strategic Air Commands of the U.S. Air Force.

The Air Defense Command is purely defensive in character and it involves all the liabilities that go with any form of purely defensive warfare. The invading force has the initiative.

The Strategic Air Command is an offensive-defensive force whose dual mission is to weaken an air force by destroying it on its home bases, and to destroy the war-making potential of the enemy nation by systematic destruction of industrial complexes, oil fields and refineries, transport systems, and everything that goes into bolstering the war effort, including the enemy's will to continue waging war.

SAC's mission is both strategic and tactical by nature. When it deals directly with the enemy air force by destroying its bombers on the ground and its bases, it is acting tactically, for it is dealing with enemy forces in action. SAC acts as a strategic force when bombing strictly strategic targets, such as the industrial system of Russia.

It is this ability—or presumed ability—to destroy the war-making power of Russia that is, without any reasonable doubt, the single greatest deterrent to war at this time. Therefore it would seem that our war planning should center around the concept that the primary war force of the future must be the atomic and

hydrogen bombs and their delivery by long range bombers.

This conception is not generally held in the Pentagon, except within the Air Force. The theory of "balanced" forces persists, and probably will persist, though how you can balance a squadron of inter-continental bombers armed with hydrogen and atom bombs against, say, a battleship, passes understanding. The only "balance" is in money appropriated.

Last June Secretary of Defense Charles E. Wilson stated that the total money available to the military in fiscal year 1954, including unspent balances from previous appropriations, would be: Army—\$30.7 billion; Navy—\$26.5 billion; and Air Force—\$40.2 billion.

However, with this \$40 billion the Air Force not only has to equip and maintain SAC and ADC. It also has to build a big tactical air force to protect the Army, and provide transport and cargo planes in the Military Air Transport Service to provide airlift for the Department of Defense. This may cost as much as \$14 billion, spent for services to the Army by TAC and MATS. It is an asset to the Army rather than to the Air Force. It does not help the Air Force to fight the air war.

Considered thus, the funds would be: Army \$45 billion; Navy \$26 billion and Air Force \$26 billion.

The Money Man

Defense Secretary Wilson often speaks of taking a new look at the situation. It might be advisable for him to take a close new look at the office of Assistant Secretary (Comptroller) W. J. McNeil, the money man of the Department of Defense. He is a very powerful force in budget discussions, and it is the budget that decides what kind of defense this nation shall have, and what shall be spent on this or that.

Mr. McNeil is a rear admiral in the Naval Reserve, and his staff of Special Assistants and Deputy Comptroller (Budget) is made up chiefly of former Navy officers, with a Brigadier General from the Army. *There isn't an Air Force man on his staff.*

Of course, it is understandable that Mr. McNeil should surround himself with Navy people, for those are the people he knows best and can best get along with. But it is hard to believe that Navy people actually have the welfare of the Air Force very close to heart, or even understand much about it. Then you consider that the Chairman of the Joint Chiefs of Staff is an admiral—although a flying one—and you have the dice heavily loaded against the Air Force.

It was Admiral Arthur Radford who spearheaded the Navy-Air Force fight over the carrier versus long range bomber controversy. If he has changed his mind since then, he hasn't said so.

It is often pointed out that Navy and Marine Air are part of American air power, and they are. But they are not strategic bombing power, and assert that they are not. The Navy underlines this by refusing to accept any assigned roles other than maintaining control of the seas. It is clear that the nation's defense against atomic and hydrogen attack rests chiefly on the Air Force.

. . . CY CALDWELL



Grandmother and child on way to rejoin "Mommy" in Santiago, Chile . . . photographed in a corner of "Fiesta Lounge" aboard El InterAmericano

"When your mommy was just your age—we flew in South America with Panagra!"

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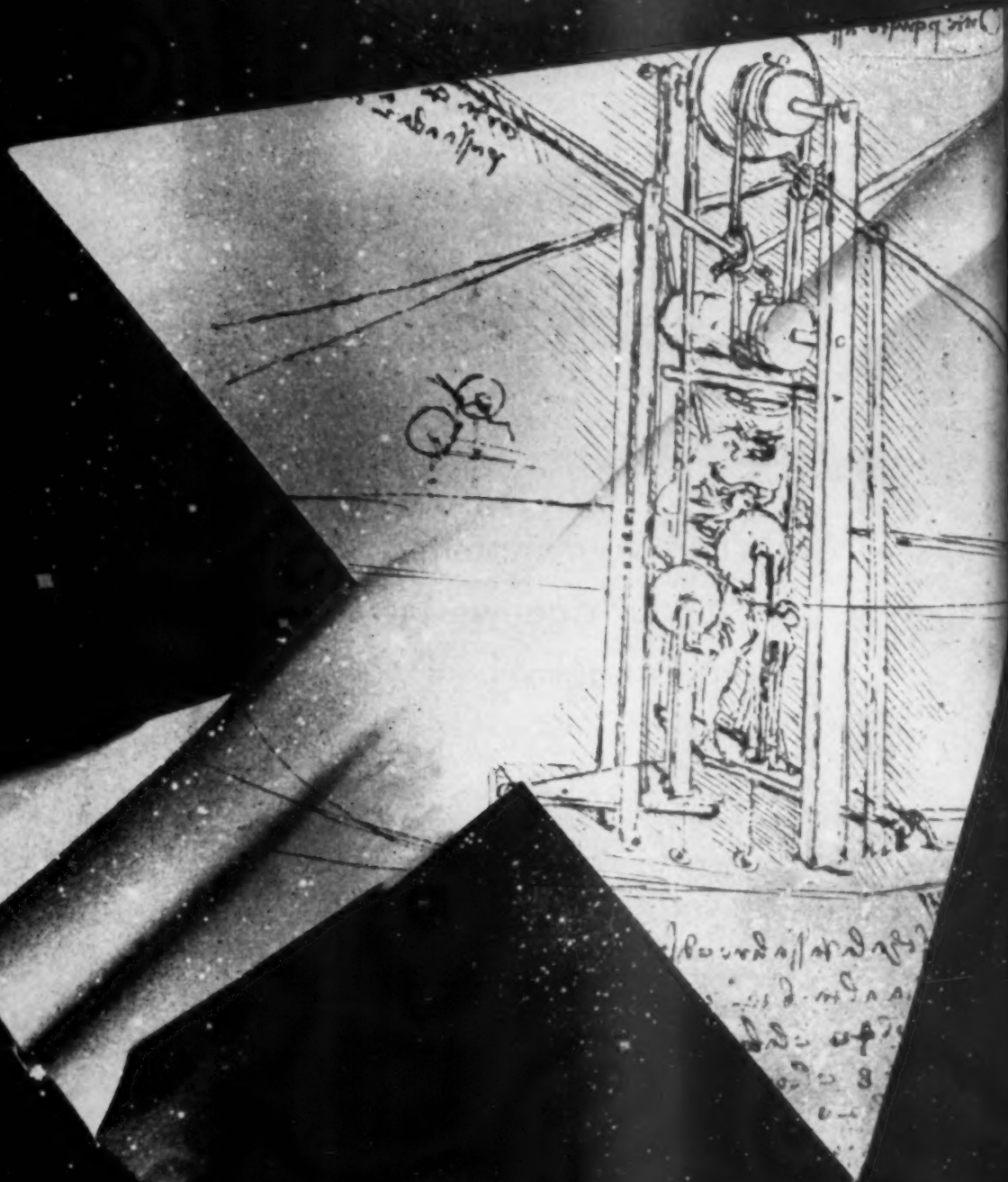
Today, Panagra offers ten flights weekly to South America . . . all by latest-type pressurized planes. Choose deluxe *El InterAmericano*, daily DC-6, or thrifty *El Pacifico*, DC-6B tourist service. Call your Travel Agent or Pan American World Airways, U.S. Sales Agent for—

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SCALE NACA MODEL, COURTESY LEWIS FLIGHT
PROPULSION LABORATORY, CLEVELAND, OHIO

EXECUTIVE AIRCRAFT MODIFICATION

BY

TEMCO



CASE HISTORY: #822-130
CUSTOMER: CONTINENTAL OIL
COMPANY
Ponca City, Oklahoma
SHIP: DC-3 N-79987

Second aircraft handled by TEMCO-Greenville for Continental Oil Company. Modification and overhaul included compliance with AD 52-22-3 (attach angles); 4000-hour wing inspection; repair of heater and installation of ground blower heater system. Previous job for this customer was patching of integral fuel tanks on Lodestar N-660.

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For further details on this case history and information about TEMCO's complete custom rehabilitation service for multi-engine aircraft, write to:

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DALLAS • GARLAND • GREENVILLE

West Coast Talk

By Fred S. Hunter



Convair will have its second YF-102 flying in a matter of days now. It's heart-breaking to lose a prototype early in a test program, and Convair had gotten in only five flights before the crack-up of the first ship. Convair whipped out the first YF-102 in record time. Now it's repeating this performance expediting the second plane to pick up the delay in the test program. One of the noteworthy accomplishments of **Barney Coggan's** San Diego division appears to have been the organization of a particularly efficient experimental production department. Cooperation and liaison between engineering and experimental has to be of a high order, too, in order to turn out prototypes on the button as Convair has been doing at San Diego. Even on turboprops, except for engines.

The October flight date for the YF-102 put the folks in Plant 2 on as tight a schedule as any experimental production section ever faced anywhere. There were those who thought Gen. Joseph T. McNarney, Convair president, was a little naive in expecting the schedule to be met. We recall last spring, when things looked more or less touch and go, having hinted the initial flight might be a little late. But the boys in experimental put up signs around the project, reading: "Make the Date With the Model 8," set out to do just that, and in due course posted new signs of triumph which read: "Made the Date With the Model 8." (Model 8 was Convair's company designation for the YF-102 project during the construction stage.)

Times do change. Kearny Mesa, outside San Diego, where the Navy's Miramar Naval Air Station is being built into a master jet base for the west coast, got its military start as an Army camp for cavalry and field artillery. This was during World War I. Camp Kearny, as it was called, was a little bigger in area. It spread out over 500,000 acres for the horse and mule soldiers. Miramar is a modest 6000. The Navy has spent about \$50,000,000 on Miramar and will have \$100,000,000 invested by the time it is completed. An interesting feature of the new construction includes the prototype of the "double-barrelled" hangar being adopted by the Navy. It is arranged with two hangar areas on either side of a shop building. Miramar supports 500 pilots, runs up about 20,000 hours of flying a month, has an outlying field (Brown at Chula Vista) for field carrier landing practice, and an auxiliary air station for gunnery, bombing, and rocket training at El Centro.

CAA delivered the type certificate on the DC-7 to Douglas Aircraft Co. on Friday, Nov. 13, but thoughtfully dated it Nov. 12.

It will admittedly take a high load factor, but United Air Lines has it figured out it can make a profit on the Boeing Stratocruisers it has begun operating between Los Angeles and Seattle, even though it can't on the Honolulu run. This, of course, is primarily because operating costs will be lower. Maintenance should be appreciably less because of the character of the domestic flights, and substantial savings will accrue from the lighter fuel loads. Moreover, since conversion of the P & W R-4360's to the B-6 type, engine performance has been improved. UAL also will have nine more seats to sell on the domestic schedules by opening up for sale part of the 14-seat lower lounge which is blocked off from sale on the Honolulu flights.

Airport bar and restaurant business is big business. Terms of proposed lease contract for this concession at the new San Francisco International Airport terminal building now being built require the successful bidder to invest a minimum of \$500,000 to fix the place up for the customers.

Paul F. Bikle, who recently won the Southern California Soaring Championship, is assistant chief of the flight test engineering laboratory at the Air Force Flight Test Center at Edwards Air Force Base. Won three out of five events.

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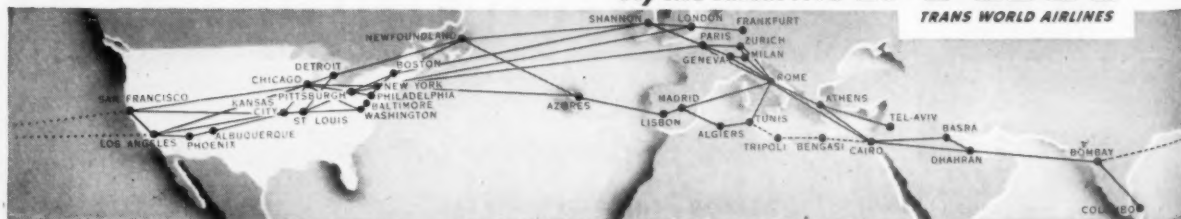
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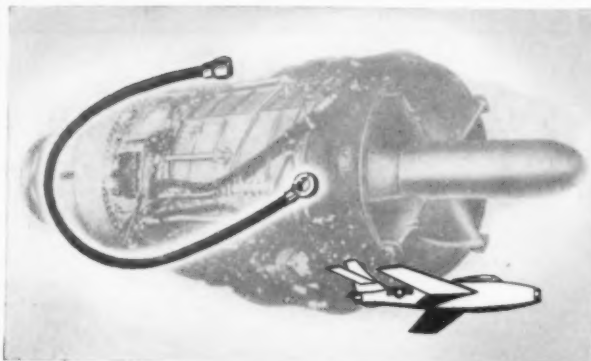


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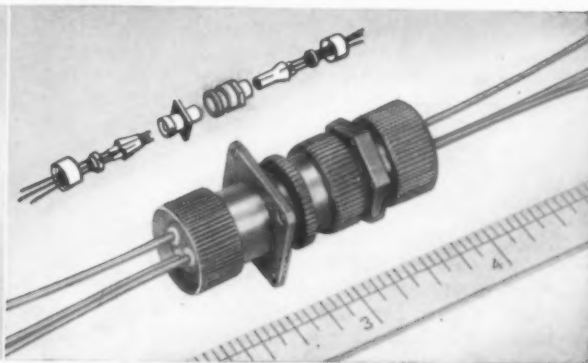
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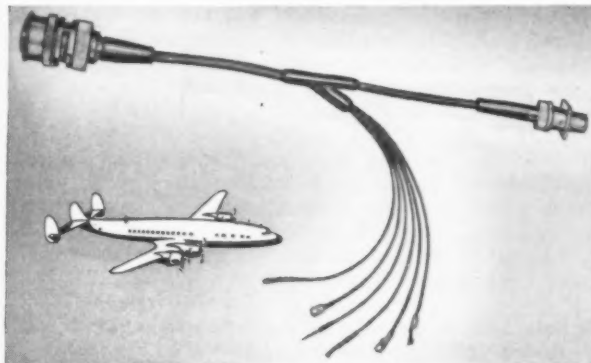
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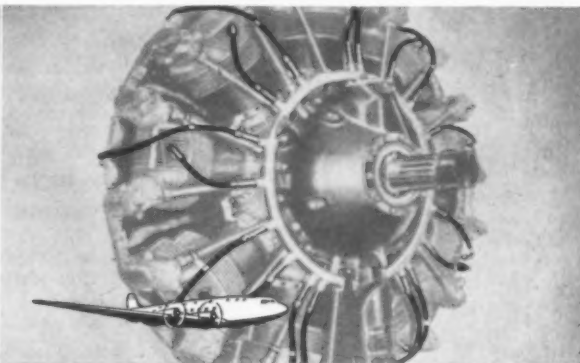
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Air Taxi Group Seeks 400% Member Increase

The National Air Taxi Conference is aiming for certification of 500 operators, Sam Freeman, president, told the recent annual meeting. Although great strides have been made in cooperation with the airlines, the increased membership is necessary before air taxi operations can be accepted on a wide national level. Membership is now about 100.

Airline representatives attending the meeting recommended that NATC work out rates on a per-passenger, rather than a zone, rate since the "airline people who have to sell the air taxi are used to the per-passenger rate and it must be made as simple as possible." It was suggested that the air taxis work this out by taking full operating costs, figuring out per-mile costs for each type of equipment, and then establishing a passenger rate that would yield them a break-even figure on a 1½ passenger ratio per round trip. Passenger carrying over that figure would represent profit.

Robert L. Turner, vice president of sales for Northeast Airlines, suggested that air taxis apply to CAB to serve cities asking for air service where it would not be economically feasible for scheduled carriers to operate.

Other action taken included: increase of aircraft public liability insurance to \$40,000 per person, \$300,000 per accident for bodily injury or death, and \$100,000 for property damage. Supplying of statistical data was made a mandatory membership requirement.

New officers elected include Walter Laundslager of Red Bank, N. J., president; Richard Washburn, Southern Flight Service, first vice president; Guy Miller, Pittsburgh, second vice president; and Walter Lotzer of Gran-Aire and Norman Larson, Burbank, as representatives.

Maintenance Briefs

Eastern Air Lines is replacing the Pesco engine-driven hydraulic pumps on all Martin 4-0-4 aircraft with Vickers pumps.

American Airlines is conducting a comparative service test with AC-271 spark plugs in the rear plug positions of the front row cylinders in two P&W R-2800 engines of one Douglas DC-6, and Champion R56S plugs in the same position of the other two engines. Standard Champion R-115 plugs will be used in all other cylinder positions on the engines.



Extra Section

By Robert R. Parrish

Bob Parrish is Managing Editor of the OFFICIAL AIRLINE GUIDE, American Aviation's standard reference of worldwide airline schedule and fare information published monthly in Chicago. Prior to joining AAP in 1947 he worked with American Airlines.

IT WAS MY GOOD FORTUNE to be included as a guest of Air France on a flight to Europe on the "Chicago Parisian," inaugurating direct service between Chicago and Frankfurt via Montreal and Paris. In addition to the new Super Constellation equipped with Wright Turbo-Compound engines which carried us from Chicago to Frankfurt in less than 16 hours flying time, Air France arranged for our party to fly in a Vickers Viscount turbojet and a de Havilland jet Comet. The tour covered 12,000 miles of Air France routes in six days.

Air France, the first foreign airline to inaugurate overseas service direct from Chicago, has established two services a week—the first class "Chicago Parisian" to Frankfurt, and a tourist flight to Paris, Milan, and Rome. The Frankfurt press flight, led by Vic Raeburn, Air France's North American public relations and advertising manager, has gone a long way toward establishing Chicago as a year-round port of embarkation for Europe.

One can't say enough for the good food, choice liquors, and courteous service aboard Air France first class flights. The Viscount as flown by Air France seats 49 passengers with a three-two seating arrangement; the width of seats and aisle may be described as adequate. The windows in the Viscount present two unusual features: They are oval and unusually large, measuring about 25½" high and 22" across, and every window is an emergency escape hatch.

There is little noise in the cabin as the turboprop engine is started, nor was there a wait in a warm stuffy cabin for an extended engine warm-up. We taxied immediately to the head of the runway, paused about five seconds, and we were on our way. Acceleration was rapid, and in spite of a full load, our ship took off after a remarkably short run. We climbed out in a very steep angle; the climb must have been all of 1500 feet per minute. We leveled out at about 20,000 feet in 15 minutes, with a cruising speed reported at 325 miles per hour. Noise level was less than that of piston engines. It was a definite relief to be rid of the rough vibration.

The turboprop is an excellent short-haul airplane and a definite crowd pleaser. The substitution of a lower constant pitch noise and smoothness for the vibration, grunts, and groans of the piston engine gives the hesitant passenger a feeling of confidence. Everyone in our party agreed that introduction of the turboprop in the U. S. would meet with as much enthusiastic approval as greeted the DC-4 when it replaced the DC-3.

Air France is operating its turboprop equipment for experience rather than profit. An Air France chief pilot told me that the Viscount, for economy, should be flown at 30,000 feet and engine revolutions increased by 1000, but that neither they nor the British have gained enough operating experience to do so at this time. The French and British turboprop operation, still in the experimental stage, may eventually prove the old adage, "Actions speak louder than words."

The jet Comet—well, no one should feel his stay on good old Mother Earth complete until he's had the thrill of a jet ride. We made the 900 mile trip from Paris to Algiers in about two hours and 10 minutes, flying most of the way at 36,000 feet, cruising speed 475 miles per hour. You can really view the topography from that height, and we had a spectacular view of the snow-capped Pyrenees. We felt some sharp bumps at low levels, but not at high altitudes.

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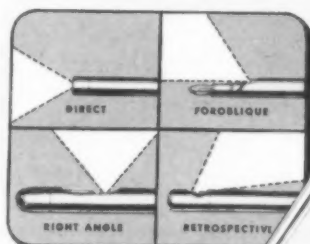
*Walter Tydon, widely known aviation engineer and aircraft designer and veteran of 25 years in aviation, is Chief Engineer of Fairchild's Aircraft Division.

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They'll Do It Every Time

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By Jimmy Hatlo



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AOPA Considers Simple Instrument Rating

A "poor man's" instrument rating curriculum is being prepared by the Institute of Aviation of the University of Illinois under contract with the Aircraft Owners and Pilots Association Foundation.

This was revealed by Max Karant, assistant general manager of AOPA, at the recent National Aviation Trades Association annual meeting in Wichita. The curriculum, when completed, will be distributed at no charge by AOPA to those interested. Called the AOPA "180° Turn Rating," it will provide sufficient training to enable private pilots safely to get out of weather.

The AOPA announcement was preceded by remarks by William P. Lear, who called lack of this knowledge of instrument flight by private pilots a "degenerative influence." "Potential customers and actual customers are being killed off," he told the fixed-base operators, "because of the rash of structural failure accidents in the 'clean' aircraft." (CAB estimates that about 96% of these accidents are caused by unqualified pilots getting into IFR conditions).

Lear asked for serious consideration of setting up some form of proficiency rating for instrument light-plane flying. He felt this proficiency could be obtained in weather flying if the pilot was able to hold an altitude within 20 to 30 feet; hold course within

20°; and maneuver a climb and dive in and out of weather, as well as selecting a heading.

"With this type of rating," Lear concluded, "a pilot won't have to wind up in the headlines or in the graveyard."

Books

TOMORROW'S AIR AGE. By Holmes Alexander. 248 pp. Rinehart & Company, New York. \$3.00

This is described as "a report on the foreseeable future" and is authored by a reputable and scholarly syndicated newspaper columnist who has delved, purely as a layman, into the mysteries and complexities of the air world.

The title may be somewhat misleading to those in aviation who would expect the book to be a forecast of plane and engine types and traffic potentials and all that sort of thing. Actually, Mr. Alexander covers a vast variety of everything under the sun which could possibly be construed as being in the air age.

It is a good book, which makes for entertaining reading. It is by no means a text. Aviation people may find fault with a number of simple minor errors of fact, but the author has warned in advance that his book is not written for the technicians.

A great deal of exploration went into the book's preparation. An even greater amount of time must have gone into the writing. As an erudite layman's portrayal of the broad impact of the air age on mere humans, it is a worthwhile book.

... WWP

Aircraft Utilization

DOMESTIC

Average Revenue Hours of Use Per Day for All Types of Equipment

	1953			
	May	June	July	Aug.
American	8:21	8:20	8:20	8:23
Braniff	6:00	6:33	6:24	6:21
Capital	8:36	8:37	8:31	8:33
Caribair	4:02	4:02	4:36	4:23
Colonial	7:32	8:19	8:13	8:07
Continental ..	6:59	6:16	6:02	6:04
Delta-C&S* ..	8:42	8:51	8:18	8:03
Eastern	8:47	8:46	8:43	8:46
Hawaiian	3:40	3:27	4:08	4:04
National	8:16	8:06	8:18	8:15
Northeast	5:41	6:44	7:58	7:45
Northwest ...	9:20	9:35	9:30	9:29
Trans Pac.	5:08	5:50	5:45	5:58
TWA	6:59	7:00	7:09	7:15
United	6:55	6:51	6:39	6:45
Western	7:10	7:16	7:41	7:49

* Merger between Delta Air Lines and Chicago and Southern Air Lines was effective March 1, 1953.

INTERNATIONAL

	May	June	July	Aug.
American ...	4:31	4:26	4:20	4:27
Braniff	7:10	7:41	7:07	6:36
Colonial	9:17	9:39	8:07	8:50
Delta-C&S* ..	9:50	9:22	8:52	8:53
Eastern	10:52	10:46	10:17	10:40
National	8:32	8:35	9:12	9:17
Northwest ...	8:28	8:55	8:40	9:07
Panagra	4:24	4:09	4:08	4:03
Pan American				
Latin Am. ...	5:12	5:45	6:11	6:00
Atlantic	6:12	6:24	6:35	6:44
Pacific	7:20	7:38	7:44	7:41
Alaska	7:44	8:49	8:01	8:53
TWA	7:35	7:52	5:51	8:21
United	6:17	6:14	6:21	6:22

LOCAL SERVICE

	May	June	July	Aug.
Allegheny	5:23	5:44	5:56	5:42
Bonanza	6:18	6:16	6:19	6:19
Braniff	6:59	6:53	6:40	6:18
Central	6:00	6:00	6:00	6:00
Frontier	6:50	6:44	6:44	6:38
Lake Central ..	6:08	5:00	6:00	6:00
Mohawk	5:17	5:35	5:36	6:12
North Central	6:45	7:56	9:25	6:01
Ozark	6:44	6:43	7:00	6:06
Piedmont	8:12	7:45	7:39	8:07
Pioneer	4:57	4:44	4:44	5:43
Southern	5:21	5:35	5:29	5:30
Southwest	4:47	4:11	4:05	4:35
Trans-Texas ..	5:02	4:52	5:40	5:50
West Coast ..	6:55	6:29	6:00	6:10
Wiggins*	2:18	3:07	2:48	*

* E. W. Wiggins Airways terminated operations as of August 1, 1953, per CAB Order E' 7534.

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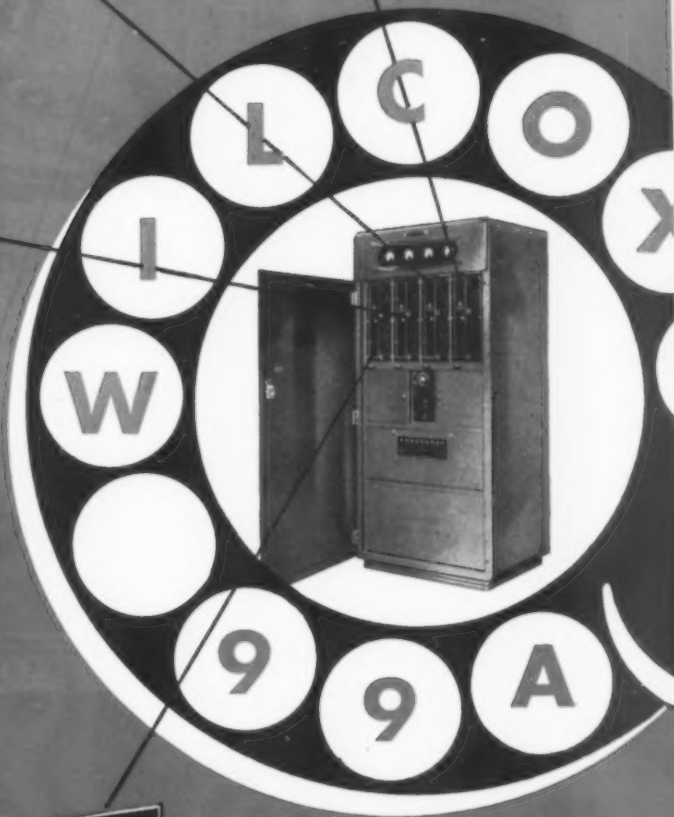
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Maintenance Bulletin Board



Conveyor Speeds Engine Overhaul

Pan American World Airways is making effective use of both overhead and ground level conveyor systems to increase operating efficiency of its new engine overhaul shop recently opened up for business by the Pacific-Alaska division at San Francisco.

Prior to establishing its own facility, the Pacific-Alaska division shipped its engines to Pacific Airmotive Corp. at Burbank, Calif., for overhaul. The last three P & W R-4360's to be overhauled for PAA by PAC are now being finished up, and after their delivery all engine overhaul and repair will be done at the division's San Francisco base.

PAA is overhauling R-4360's and R-2000's in the new shop and is installing the necessary tooling to add R-2800's to the list after the first of the year when Douglas DC-6B's go into service on the Alaska division.

Instead of making a pocket edition of its Miami facility, PAA combined applicable features of Miami with a few ideas from United Air Lines' big maintenance base across the way in San Francisco, plus an idea or two of its own to set up the compact new shop for the Pacific-Alaska division. Still not entirely equipped, it is now turning out 18 engines a month on one 40-hour shift. It has a capacity of 65 R-4360's per month.

Example of its conveyor system applications is the 10-station ground level

cylinder line. These are the stations along the conveyor after cleaning:

- **Inspection:** A tag is attached to the cylinder designating such rework as is to be done.

- **Removal of valve guides and seats:** This station includes preheating oven. Guides and seats are removed with a water injection removing system.

- **Boss boring machine:** This is new-type self-lining guide boss boring machine.

- **Installation of valve guides and seats:** This station includes preheating oven.

- **Valve guide reaming machine:** This is also self-lining type.

- **Valve seat grinding machine.**

- **Cylinder lapping machine.**

- **Final assembly.**

- **Pressure checking.**

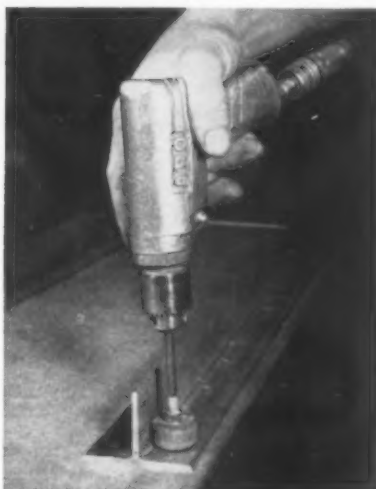
- **Installation on overhead conveyor for storage.**

Other sub-assemblies covering blower sections, nose sections, and power sections are set up in similar compact fashion to save on man-hours. Cleaning tanks, spray booths, buffers, and shell blasters are included in the cleaning equipment, and hydraulic lifts are used both in assembly and disassembly to raise engines to efficient working levels.

PAA went to Belgium, France, and Germany for machine tools on which

it was unable to obtain delivery in this country in fully equipping its machine shop. Its plating shop is fitted for cadmium, tin, copper, silver, chromium, lead and indium work. Example of PAA's program of carrying the shop's self-sufficiency as far as possible is the fact that it is in process of working its own knuckle pins.

Ed Giles is foreman of the new San Francisco engine facility and Robert Carpenter is assistant foreman. Both formerly were in PAA's engine shop at Miami.



New Tool for Finishing Parts

Convair San Diego Division has adopted a new tool for finishing aircraft parts which brings annual savings in excess of \$4500, produces higher quality workmanship and allows the operator to reach heretofore hard-to-reach areas.

The tool uses a small circular section

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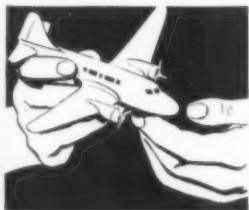
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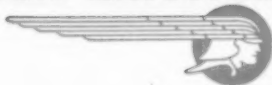
Since 1928, aircraft owners from coast to coast have made SPARTAN'S facilities at Tulsa their landmark of repair, overhaul and conversion. In 1946, the volume of business from the eastern seaboard made the establishment of a base at Trenton, New Jersey, advisable. Now, at either of these, you are assured of the finest in aircraft service. SPARTAN invites you to fly in for a visit to inspect their shops and see how they will take care of your plane. If not convenient to visit, a phone call, telegram or letter will bring information as to how we may serve you.



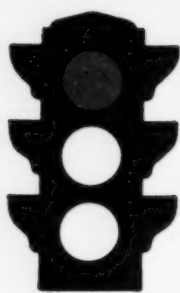
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Today's executives are turning to Bell helicopters to avoid surface traffic jams and save valuable hours in traveling from factory-to-factory, office-to-factory, factory-to-airport and for safe and quick trips to nearby communities.

One company estimated that executive time lost in just traveling from factory to airport reached \$1,000 a day. A Bell helicopter not only can save that important time but also doubles as an all-around aerial messenger, hustling high priority mail and material from facility to facility.

Port of New York Authority cut travel time for executive and engineering personnel from two hours on the ground to 20 minutes with a 3-place Bell helicopter; a New Jersey utility company developed a helicopter shuttle run between widely scattered installations; and an East Coast executive uses a helicopter exclusively for business trips in a radius of 100 miles of his headquarters.

Its low initial investment, simplified maintenance and economical operating cost—*plus built-in safety and efficiency*—makes the Bell helicopter a practical form of transportation for the busy executive.

The Bell Model 47 helicopter has been thoroughly proven by more than a million hours of operation in the United States and 30 foreign countries. It is a product of the world's largest manufacturer of commercial helicopters—Bell Aircraft.

Write for complete details:



BELL *Aircraft* CORPORATION

Texas Division, P. O. Box 482, Fort Worth 1, Texas

of emery paper which is held firmly against the part by a cylindrical piece of rubber. It obsoletes past methods of part finishing which involved hand polishing of small assemblies with the emery paper wrapped around a block of wood. With the new tool 3000 less hours are now being expended by Convair annually for equivalent parts finishing.



NEW LIGHTWEIGHT passenger loading ramp is introduced into service by WAL vice president of service Marvin Landes with Tracy Day, general manager of Tobey Mfg. Corp. which produced the ramp, and WAL stewardess Lois Browning on hand.

Western Receives New Passenger Ramps

Western Air Lines has taken delivery of the first of an order of several new passenger loading ramps built by the Tobey Manufacturing Corp. of El Segundo, Calif., which are said to weigh only one-third as much as conventional ramps of this type.

The new Tobey ramp is of all-aluminum construction, is easily disassembled for shipping, and uses a special foot-brake for locking in position at the aircraft entrance. A built-in illumination system powered by a storage battery provides concealed lighting from beneath the channels on each side of the ramp.

Evacuation Chutes For Northwest

Emergency evacuation chutes being installed in Northwest Orient Airlines' Douglas DC-4 and Boeing 377 aircraft weigh 30 pounds each and are fabricated in NWA shops from vinyl-coated fibre glass material produced by the Duracote Corp.

Although the new slides replace the conventional ditching ropes for passenger evacuation in emergencies, Northwest will retain the ropes in the aircraft.

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T-6 Advanced Trainer — Used by 33 Allied Nations in W. W. II. Provided close tactical ground support in Korea.



B-25 Mitchell Bomber — Served in all theaters in W. W. II in several different bombing capacities...including famous first bombing of Japan. Rugged, practical, heavily armed.



P-51 Mustang — Leading fighter of W. W. II. Served as photographer, dive bomber, strafers, escort, spotter, for close ground support. Held line in Korea before Sabres arrived.



B-45 Tornado — First operational multi-jet airplane to fly in the U. S. First to fly non-stop across the Pacific.



T-28 Trainer — Faster than many W. W. II fighters with top speed of 346 MPH. 1,000 already delivered to Air Force. Now being delivered to Navy.



F-86 Sabre Jet — News making king of MiG Alley with kill ratio of 12 to 1 over MiGs. Produced in Australia and Canada and in Italy for NATO. Acclaimed as best all 'round fighter in the world.



F-86D Sabre Jet — America's only one-man, all-weather interceptor. Rocket firing. Now operational as primary continental defender...with 700 MPH *plus* speed.



FJ-3 Fury Jet — Latest of North American's FJ Series of Navy carrier-based fighters. With faster speed and rate of climb and superior firepower.



F-100 Super Sabre — Tri-sonic performance with overall weapon effectiveness. Now in production for Air Force. Flies faster than speed of sound in level flight.

NORTH AMERICAN HAS BUILT MORE AIRPLANES THAN ANY OTHER COMPANY IN THE WORLD

DECEMBER 7, 1953



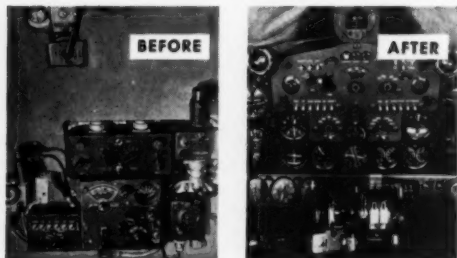
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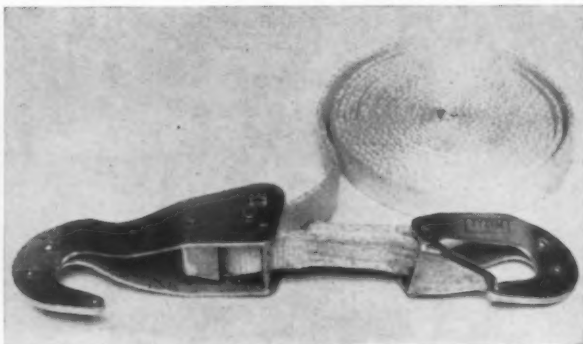
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New Products



Cargo Tie-Down Devices Developed

The Eastern Rotorcraft Co. of Doylestown, Pa., has announced commercial production of a variety of applications of its new locking device, trade named Tyzem, in aircraft mooring and airborne cargo tie-down devices.

The new Eastern products were initially developed for military usage and include:

- Nylon cargo straps one inch wide with an automatic locking grip. Assembly is rated at 1250 pounds and weighs only $\frac{3}{4}$ of a pound. A 2" wide cotton webbing strap and locking device with the same load rating but weighing 1 $\frac{1}{4}$ pounds is also being produced.

- Aircraft mooring cables for executive and light airplanes. The unit for

executive planes is priced at \$12, and that for small aircraft at \$9.

The company has also introduced a new tie-down cable mechanism for securing air cargo shipments which is rated at 5000 pounds and sells for \$23.25. It is made up of a nine-foot length of 7/32" 7 x 19 galvanized aircraft cable with a cable hook on one end and the patented Tyzem lock unit, through which the cable is passed and secured on the other end.

Main feature of the new Eastern products centers in the new locking unit, its ease of installation, positive locking characteristics when installed and simplicity of disconnecting.

Address: Eastern Rotorcraft Corp., Box 110, Dept. AAP, Doylestown, Pa.

New Lear Navigation System

Lear, Inc., LearCal Division, has announced production of a new airline-type VHF Omnimeter navigation system. It uses a meter type cockpit instrument presentation and includes a shock-mounted converter and power supply, and Lear VHF receiver.

The Omnimeter presentation is a standard aircraft instrument including the "Left-Right" deviation needle indicator, a "To-From" meter, and a course selector that is fully rotatable 360°.

Although developed to meet the operational requirements of single and heavier multi-engine aircraft, the new Lear system

is said to be light and compact enough for most small executive aircraft. The Omnimeter installation will be made available for both 12- and 24-volt electrical systems.

Address: Lear, Inc., LearCal Division, Dept. AAP, 11916 West Pico Blvd., Los Angeles, Calif.



Sampling Gage. A new sampling device called the Visa-Test gage is designed to provide an accurate cross-sectional measurement of the water, sludge, or foreign matter accumulation at the bottom of liquid storage tanks. Priced at \$12, the gage uses components which are not affected by any petroleum product.

A measurement tape within the test tube of the gage, is printed in white plastic with a clear plastic coating to pre-

vent discoloration.

Address: Visa Test Sales Co., Dept. AAP, 1515 Alturas Drive, Burlingame, Calif.



Food Tray. A new airline type plastic food tray carrier molded from the American Cyanamid Company's Laminac polyester resin and fibrous glass is saving up to 27 pounds per airplane when used in place of the previous wood-lined aluminum carrier in Convair 240 airplanes.

A joint development of American Airlines and the Steiner Plastic Manufacturing Co., the new Laminac tray is not only less costly than its predecessor, but its design is said to eliminate the need for one of the four carriers previously required on Convairs, without necessitating a change in the actual tray design.

Weight of the new unit is 15 pounds, compared with 18 pounds for the earlier design. By elimination of the fourth carrier on Convairs, the total weight saved is 27 pounds.

Insulating properties of the new material now permit the use of single-wall construction in place of the double-wall design previously used. This factor, combined with the space saving features of molded-in grooves to hold the trays in place, increases the carrier's capacity to 14 trays.

Address: American Cyanamid Co., Dept. AAP, 30 Rockefeller Plaza, New York, 20, N. Y.

Snow Plow. A new rotary snow plow which mounts on the front end hydraulic loader of industrial wheel-type tractors is particularly well suited for snow removal around industrial plants, airports and parking lots according to its manufacturer, the Wm. Bros Boiler & Mfg. Co.

Designed to handle snow removal beyond the scope of sidewalk units but still too small for large highway equipment, the new Bros Series "A" Sno-Flyer features a rotor feed rake which quickly disposes of heavy wet snow. A casting





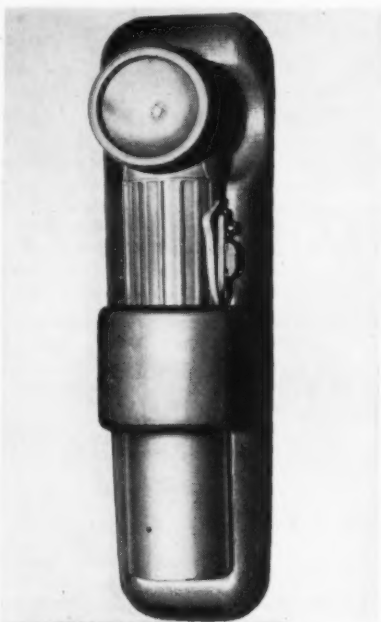
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chute which can be rotated through an arc of 180° permits spot casting of snow in confined areas.

Address: Wm. Bros Boiler & Mfg. Co., Dept. AAP, 1057 10th Ave. S. E., Minneapolis 14, Minn.



Emergency Light. A new aircraft emergency exit lighting unit which weighs less than one pound and which can be set to light automatically under any impact load between two and six g's has been placed on the market by the B. K. Sweeney Mfg. Co.

The Sweeney No. 10001 inertial flashlight is designed for easy positioning in an airplane cabin to illuminate doors or emergency exits without necessitating bulkhead modifications. It uses two standard flashlight dry cell batteries and in emergencies will also serve as an ordinary hand-held flashlight.

Address: B. K. Sweeney Mfg. Co., Dept. AAP, 1601 23rd St., Denver 17, Colo.



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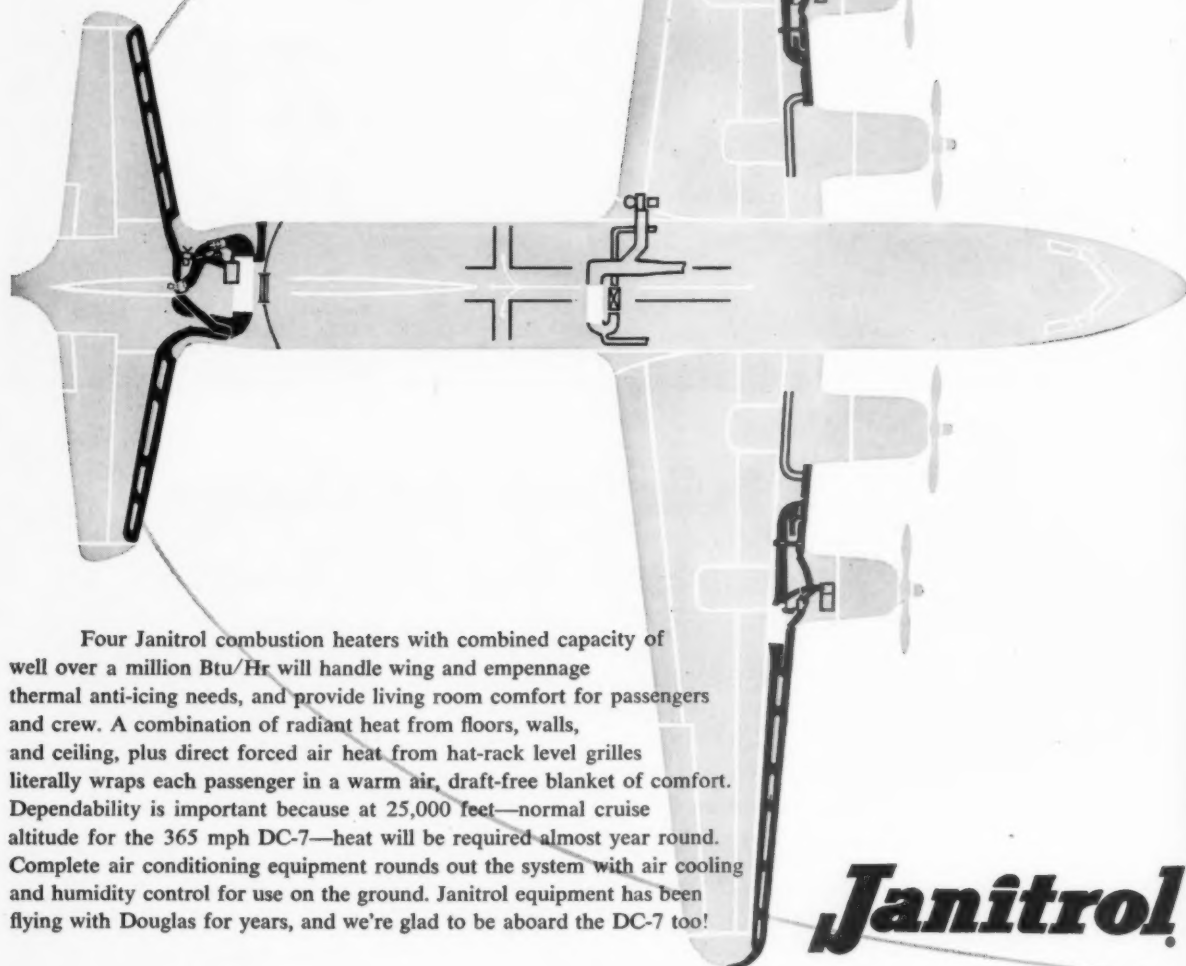
World's most experienced designer and builder of aircraft turbine engines—J35 and J71 Axial, J33 Centrifugal Turbo-Jet engines, T38 and T40 Turbo-Prop engines.

DECEMBER 7, 1953

THE NEW DOUGLAS

IS JANITROL EQUIPPED

DC-7



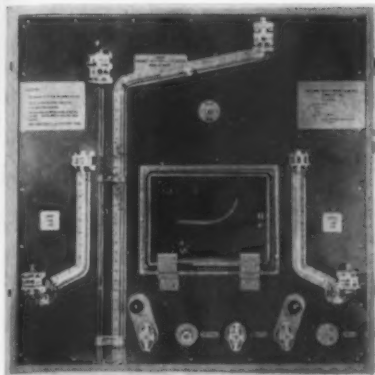
Four Janitrol combustion heaters with combined capacity of well over a million Btu/Hr will handle wing and empennage thermal anti-icing needs, and provide living room comfort for passengers and crew. A combination of radiant heat from floors, walls, and ceiling, plus direct forced air heat from hat-rack level grilles literally wraps each passenger in a warm air, draft-free blanket of comfort. Dependability is important because at 25,000 feet—normal cruise altitude for the 365 mph DC-7—heat will be required almost year round. Complete air conditioning equipment rounds out the system with air cooling and humidity control for use on the ground. Janitrol equipment has been flying with Douglas for years, and we're glad to be aboard the DC-7 too!

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National Sales, Engineering, Production Headquarters, 400 Dublin Ave., Columbus 16, Ohio. District Engineering Offices: New York, 225 Broadway; Washington, D. C., 4650 East-West Highway; Kansas City, 2201 Grand Ave.; Ft. Worth, 2509 West Berry St.; Hollywood, Calif., 7046 Hollywood Blvd.; Columbus, Ohio, 400 Dublin Ave. Executive Offices: 2375 Dorr St., Toledo 1, Ohio.



Oxygen Test Stand. An oxygen regulator test stand developed especially for the newer diluter demand design of regulator and capable of measuring rates of flow, air-to-oxygen ratios, actuating suction, leakage rates, and delivery at very high altitudes has been announced by the National Instrument Laboratories, Inc.

Designated the model OTS-562 stand, the new National device uses two Vol-O-Flow meters with a range of 0-165 liters per minute to measure rate of flow. A manometer for measuring actuating suction is designed to accommodate current regulators in production and uses a scale of 2" to 29" Hg.

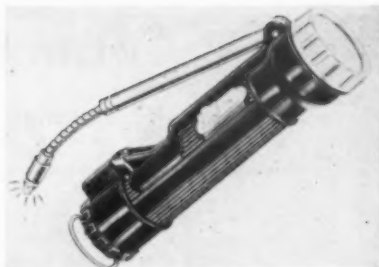
Address: National Instrument Laboratories, Inc., Dept. AAP, 6108 Rhode Island Ave., Riverdale, Md.



Standard Cell. A new electronic standard cell which furnishes a stable power supply from a 28 volt d-c input and serves as a power source for instruments which measure temperature, power, motion, strain, velocity and mass flow is being produced by the Hastings Instrument Co.

The new cell is said to have less than a 0.15 percent change in output when used intermittently and less than 0.1 percent in continuous use. A-C ripple of less than one millivolt is also claimed, making its use adaptable to all types of recording oscilloscopes.

Address: Hastings Instrument Co., Dept. AAP, Hampton, Va.



Flashlight. An industrial flashlight with a special built-in probe for pin-point inspection of inaccessible areas has been

announced by U. S. Electric Mfg. Corp. Called the Usalite Duo-Flex, the new light has a 1000-foot beam for the main work light and uses a flexible sliding cable with a small bulb and plastic guard for the probe arrangement.

With the probe arm extended, light is automatically transferred from the main beam to the small bulb, and the extension tube encased in the arm can be "goosenecked" around corners, thereby facilitating work or inspection in out-of-the-way locations.

Address: U. S. Electric Mfg. Corp., 222 West 14 St., New York, N. Y.

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Airline Commentary

By Eric Bramley



On the weekend of November 21, AMERICAN AVIATION had four people doing some fast traveling. Wayne Parrish, editor and publisher, was aboard Air France's Super Constellation Golden Parisian flight to Paris. Fred Hunter flew Los Angeles-New York and return on American's DC-7 press inaugural. We rode the AA DC-7 in the reverse direction. Bill Henzey was with National on its Los Angeles-Miami DC-7 delivery flight (a record five hours 50 minutes).

Our DC-7, piloted by H. L. ("Red") Clark, AA's eastern regional supervisor of flight, flew Los Angeles-New York in six hours 31 minutes at average speed of 380 mph. This, we believe, is a record for a commercial transport carrying passengers (an Eastern Constellation clocked 6:17 on a delivery flight in 1949). The 57 passengers got quite a thrill when co-pilot Walt Braznell, AA director of flight, announced from the cockpit that during the descent from Reading, Pa., to New York, the Wright-powered (Turbo-Compound) DC-7 reached ground speed of 475 mph. Average tailwind on the flight was 30 to 35 mph.

This AA non-stop coast-to-coast Mercury service is top-drawer. Passengers board via the red carpet; meals are excellent (drinks served before and after eating). Seats on the flight are reserved; passengers can designate the part of the cabin they prefer when they make their reservations. A special word about the DC-7 seats, built for AA by Douglas: they're the most comfortable we've seen yet—foam rubber with contour backs and improved headrests. The Mercury is a wonderful way to cross the continent.

TWA has now placed in domestic operation its new automatic 81-D1 teletypewriter communications system, a real aid in improving service to the customer. Engineered by American Telephone and Telegraph, the system increases by 75% the speed of passenger reservations and company operational messages. It's said to be "as automatic as a dial telephone." Even at peak hours a transcontinental message takes less than five minutes. In the near future relay equipment in New York will enable domestic messages to be sent directly overseas via relay teletype circuits. More details on the system later.

A top promotional job—and a much-needed one—is being done by Walt Sternberg, president of Resort Airlines, the only carrier certificated by CAB exclusively for tours. Since he took over the presidency, Sternberg has overhauled merchandising methods. He's been "on tour," talking to groups of travel agents and airline sales personnel in various cities, explaining exactly what Resort has to offer. We sat in on one of the meetings recently; our airline friends told us it was the first time they'd had a clear explanation of the "flying houseparty" plan. Walt's sales methods should help Resort immeasurably.

ODDS AND ENDS: Delta-C&S' new film, "The Great New South," is an A-1 educational presentation. Produced by Burke Dowling Adams and Film Production Center . . . Eastern Air Lines' "Span of Flight" program, in which it is showing the oldest and newest planes as part of its 25th anniversary celebration, has attracted 2,300,000 spectators in 27 cities so far . . . Congratulations to G. Marion Sadler, American's Buffalo sales manager—he's received AA's distinguished service award for merit in recognition of his development of a system-wide course of training for sales representatives . . . Note to John Carey, who operates the airport buses in New York: a special commendation to Mr. A. Martin, the most courteous Carey driver we've ever ridden with.

People

AIRLINE

Dr. L. A. Slotemaker, executive vice president of foreign relations for KLM Royal Dutch Airlines, has been appointed chairman of the Air Transport Committee of the International Chamber of Commerce.

Charles L. Hood, former head of National Airlines' cargo sales department, has been elected vice president of sales for Riddle Airlines. **John Paul Riddle**, until recently president of Riddle Airlines, has been named president of National Union Life Insurance Co., Miami.

Walt Rollins has moved up from Tulsa Regional sales manager for Central Airlines to sales manager for the entire system. At the same time, **James C. Dixon** was named traffic manager and **E. H. Evans** was appointed superintendent of stations.

MANUFACTURING

Dean C. Smith, director of customer relations for Lear, Inc., has been elected a vice president of the concern.

Edmund L. Ryder has been named assistant manager of AiResearch Aviation Service Co., Los Angeles. Ryder's previous post, chief engineer, will be filled by **Frank R. Berry, Jr.**, promoted from project engineer.

Larry Eigenrauch has been promoted from production manager to sales manager for Eclipse-Pioneer Division Foundries of Bendix Aviation Corp.

John H. Carter is the new assistant director of development planning for Lockheed Aircraft Corp.

Edward N. Townsend, formerly superintendent of supply and controls for Lockheed Aircraft Service-International, has been appointed to the newly created post of the company's works manager.

• **Charles Schrader**, Fairchild Engine and Airplane Corp. Experimental test section supervisor, Farmingdale, N. Y. 23 years.

• **William A. Stockert**, Fairchild En-



Western Air Lines veterans

receiving 25 year pins recently are, left to right, **W. Edgar Eatchel**, WAL general foreman at San Francisco International Airport; **Frank Eastman**, dispatcher at Los Angeles International Airport; and **Fred Kelly**, WAL's No. 1 pilot.

DECEMBER 7, 1953

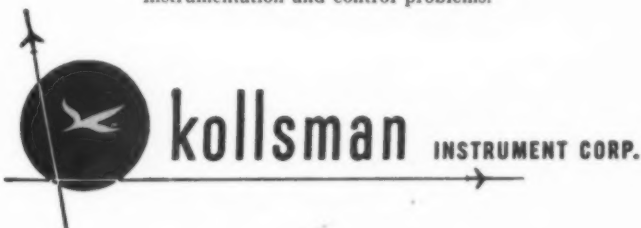


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Company connection.	Company connection.

gine and Airplane Corp. Experimental assembly foreman, Farmingdale, N. Y. 25 years.

S. B. Poritzky has joined the staff of Aeronautical Radio, Inc., as technical staff assistant, electronic engineering, filling the vacancy created when Clarence Rice left to join Bendix Aviation Corp.



The following employees recently completed 20 years or more of service in the aviation industry:

The Wright Aeronautical Division of Curtiss-Wright Corp., in mass ceremonies, recently awarded service pins to the following employees of its four New Jersey plants.

• **30-YEAR PINS:** Alleene Abele, James Allen, Carl Benzin, David Davidson, Alfred Ferrand, Richard Heusser, Robert Hoffman, Herbert Humphries, Thomas Hutchinson, Albert Kimber, Joseph LeVecchia, David McMurray, James Mather, John Matthews, William Mitchell, Hein Mock, Ragnar Pearson, John Rams, Fred Ruport, Louis Schneek, Joseph Svenson, and Alfred Garaventi.

• **25-YEAR PINS:** Anna Aisenbrey, Carl Anderson, Andrew Baska, Henry Bauder, Lewis Beecher, Dean Brawer, George Burhans, William Cameron, Sven Carlson, John Chaney, Herbert Colvin, William Conn, James Copeland, Joseph Corrado, Maurice Crittel, John De Jonge, Charles De Paola, Edwin Dodd, Otto Fava, Edwin Fivehouse, Charles Fleissner, Thomas Fogg, Joseph Foster, Vasco Fontana, Peter Gilewicz, John Grassfield, Irving Gunther, Ross Hambleton, James Hannan, John Hecht, Arthur Herrmann, Walter Hopkins, James Johnson, Carl Kauffman, Joseph Kutner, Louis LaJeunesse, Raymond L'Ecuier, Harry Lucas, William McGoldrick, Robert McWhinney, Joseph Michalko, Richard Moldenke, Jr., William Molt, John Moore, Leo Mullen, Stephen Nath, Harry Ninnis, Fred Norris, Elmer Ogden, Walter Olmesdahl, Charles Pesek, May Pickering, Andrew Pinarcik, Edward Postma, John Post, George Prunier, Augustus Purn, David Rosano, Albert Rosener, Jerry Ruby, Henry Schipul, August SeFrank, Anita Sella, Fred Sieber, Joseph Skelton, James Skillen, Henry Spalt, William Spence, Kenneth Stark, Edward Steens-tra, Adam Strosenreuther, John Tanis, Frank Thatcher, James Thomson, Irving Tonkin, George Vedder, Steve Wadase, James Wagner, John Wiseman, Herbert Wood, and Alfred Zoppo.

PHOTO CREDITS

13—ALCOA, Smithsonian; 15—Douglas; 16—Taylor; 17—Douglas; 18—P&W; 20—Douglas; 22—Con-vair; 28—U. S. Army; 36—C-W; 44—PNYA; 50, 51—Douglas.

NAL Would Fly Non-Subsidy 'Copters

National Airlines has asked the CAB for a special exemption to operate a non-subsidized helicopter service within a 150-mile radius of Miami. Passenger and cargo operations are proposed but mail service will be provided if desired by the Government.

It is the first specific helicopter proposal by a U. S. trunk carrier, National now possesses one Sikorsky S-55 helicopter and plans to acquire two additional planes.

The carrier told CAB it intends to apply for a certificate to operate helicopters in southern Florida, but desires an exemption to begin immediate experimentation.

There are currently three certificated helicopter services in the country, one each in Los Angeles, Chicago, and New York. Upwards of 48 companies have applied for certificates at various cities throughout the country. Those operating and those proposed contemplate government subsidy assistance.

National said it would provide mail service if desired at its current non-subsidy rate. It recently filed a tariff naming a \$2 per plane-mile rate for charter operations.

A pilot training program currently faces the line, with Charles Cover, a veteran of 1000 hours in helicopters, handling instruction. • • •

Final FTL-Slick Merger Decision Due

The CAB has taken the Flying Tiger-Slick Merger Case under advisement for a final decision, which could be forthcoming at any time. After a heated oral argument before the Board, the case had resolved itself into a question of whether approval should take place now or be deferred until renewal issues affecting temporary certificates of the lines can be decided.

Both Tigers and Slick operate under five-year grants issued in August, 1949. Sometime in the near future, CAB expects to begin formal proceedings to determine if extensions of those certificates should be granted.

Both Norman E. Meyers and William E. Miller, counsel for FTL and Slick, respectively, argued strongly to CAB that action on the merger is necessary at this time. They claimed opponents of the merger are trying "to

keep us weak and divided" until the renewal case is tried.

Miller advised CAB that Slick has "gone backward" in the past six months owing to the "uncertainty of the merger."

CAB Examiner F. Merritt Ruhlen has recommended approval of the merger, under which Slick would be absorbed by FTL. The CAB's bureau of air operations counsel, Francis H. McAdams, however, opposes the consolidation or, as an alternative, recommends deferral for the renewal case.

American Airlines, considered chief opponent of the deal, said it was not asking rejection of the merger, only deferral of a final decision. Otherwise, said Daniel M. Gribbon, AA lawyer, the Board would be starting a whole new experiment in the all-cargo field.

CAB MISCELLANY

Continental Charters, Economy Airways, and Aviation Corporation of Seattle have transferred membership to Aircoach Transport Association from the Independent Military Air Transport Association, swelling ACTA's non-scheduled membership to 43 carriers.

City of Aiken, S. C. has applied to CAB for scheduled service by Delta-C&S Air Lines to and from Charlotte,

North Carolina.

Braniff Airways applied for new Dallas-Miami route in "protective" move in case CAB brings a Florida-Texas application of National's into the Additional Southwest-Northeast Case.

Allegheny Airlines applied for authority to operate less than the two required daily stops at Lock Haven, Pa. during the "winter months."

CAB News

AS OF NOW . . .

CAB's so-called ACTA and IMATA Agreements Case, in which a prehearing conference is scheduled for early December, may serve as a springboard for a further split between the two associations of independent airlines. Case primarily involves proposed changes in operating functions of the associations, but one or both organizations may ask for separate hearings.

In another case just getting underway this month, The Air Traffic Conference Agency Resolution Case, the scheduled airlines and travel agents will open their fight on airlines' proposal to cut commissions on long-haul domestic business. Airlines plan to retain five per cent commission but subject to maximum payment of \$1.50 on one-way tickets and \$3 on round-trip flights. American Society of Travel Agents has filed formal protest.

Airline parties to the New York-Balboa Through Service Case look for oral argument before CAB to be held in late December or early January now that CAB Examiner Thomas L. Wrenn has issued his second report. After the argument, final CAB decision will be prepared and sent for the third time to the White House.

CAB CALENDAR

Dec. 7—Prehearing conference in The Air Traffic Conference Agency Resolution Case. Washington, D. C. Docket 6265.

Dec. 8—Prehearing conference in The ACTA and IMATA Agreements Case. Washington, D. C. Docket 6113.

Dec. 8—Hearing in United Air Lines Mail Rate Case—Hawaiian Operations. Washington. Docket 2913.

Dec. 14—Hearing in South Atlantic Renewal Case (Pan American World Airways). Washington, D. C. Docket 5818.

Dec. 15—Hearing in Braniff Airways Route 106 Renewal Case. Washington, D. C. Docket 6060 et al.

Jan. 6—Hearing in Northeast Airlines—Provincetown Service Case. Washington, D. C. Docket 6204.

Jan. 6—Hearing in Charleston-Columbus Service Case. Tentative. To be announced. Docket 6346.

RECENT CAB DECISIONS

• **Delta-C&S Air Lines** motion for joint consideration of its Miami-Havana route application with New York-Balboa Case, denied.

• **Riddle Airlines** bid for exemption to carry passengers on northbound Puerto Rico-U. S. flights denied as "too complex and important" to be decided without hearings.

• **Capital Airlines'** complaint against Northwest Airlines practice of serving alcoholic beverages dismissed.

• **Wheeler Airlines Ltd.**, Canadian line, authorized to conduct aerial photography flights in Vermont area under contract with U. S. firm.

U. S. International Airline Revenues and Expenses, Six Months Ending June 30, 1953

AIRLINES	TOTAL OPERATING REVENUES	PASSENGER REVENUES	U. S. MAIL REVENUES	FOREIGN MAIL REVENUES	EXPRESS REVENUES	FREIGHT REVENUES	EXCESS BAGGAGE REVENUES	NON-SCHEDULED TRAMP REVENUES	TOTAL OPERATING EXPENSES	AIRCRAFT OPERATING EXPENSES	GROUND & INDIRECT EXPENSES	NET OPERATING INCOME BEFORE INCOME TAXES
American	\$ 2,472,180	\$ 2,025,383	\$ 41,003	\$ 44,121	\$ 1,631	\$ 239,333	\$ 32,214	\$	\$ 2,344,095	\$ 1,141,299	\$ 1,202,836	\$ 128,085
Braniff	4,310,761	2,925,190	1,008,089	99,734	. . . .	176,835	84,926	. . . .	4,885,584	2,380,489	2,505,095	-574,823
C & S *	1,445,879	1,003,505	280,846	4,968	. . . .	109,009	33,852	. . . .	1,314,782	617,315	696,967	131,097
Colonial	1,322,004	1,243,943	29,906	7,488	. . . .	8,558	7,684	4,053	1,204,582	536,710	667,872	117,422
Delta-C&S **	652,462	571,164	10,116	2,838	. . . .	42,441	24,464	. . . .	664,047	328,424	335,623	-11,585
Eastern	4,754,155	4,022,252	130,059	. . . .	. . . .	66,645	71,637	464,274	2,930,813	1,848,105	1,082,708	1,823,342
National	1,613,690	1,515,730	13,705	. . . .	6,781	40,424	34,697	2,353	1,760,600	708,712	1,051,888	-146,910
Northwest	8,953,411	4,502,850	2,394,416	296,364	34,157	1,500,865	67,602	36,736	8,562,096	3,891,711	4,670,385	391,315
Panagra	8,664,899	5,934,772	1,250,930	399,063	. . . .	601,406	199,289	18,496	7,736,548	3,206,855	4,531,693	926,351
PAA	32,921,978	23,640,150	3,585,320	773,925	. . . .	3,636,039	550,837	189,950	34,665,696	15,145,399	19,520,297	-1,743,718
Latin Amer.	34,482,439	23,796,693	6,133,200	1,299,764	. . . .	2,425,633	538,650	93,190	35,942,938	17,471,441	18,471,497	-1,460,499
Atlantic	22,785,714	14,202,610	5,613,981	691,856	. . . .	1,624,432	252,605	178,662	19,940,287	11,550,085	8,390,202	2,845,427
Pacific	3,244,776	1,667,612	778,300	. . . .	. . . .	612,875	18,390	. . . .	3,141,462	1,482,625	1,658,837	103,314
Alaska												
TWA ***	25,171,538	19,374,473	1,633,620	1,560,602	. . . .	1,745,559	492,426	97,243	25,031,477	11,645,180	13,386,297	140,061
United	3,773,732	3,459,209	160,309	. . . .	. . . .	73,931	29,568	. . . .	4,818,569	2,827,145	1,991,424	-1,044,837
TOTALS	156,569,618	109,890,536	23,063,800	5,180,723	42,569	12,903,985	2,438,841	1,247,282	154,945,576	74,781,955	80,163,621	1,624,042

* Figures are through April only, since company merged with Delta Air Lines on May 1, 1953.
 ** Figures are from May 1, 1953, effective date of merger between Delta Air Lines and Chicago and Southern Air Lines.
 *** Compensation for carriage of U.S. mail has been paid on basis of temporary rates.

NOTE: Data in above tabulations were compiled by American Aviation Publications from reports filed by the airlines with the Civil Aeronautics Board. Figures for American Airlines include that carrier's service to Mexico but not to Canada; for Braniff to South America; Delta-C&S to South America; Colonial to Bermuda; Eastern to Puerto Rico; National to Havana; Northwest to Orient and Honolulu, and United to Honolulu. Operations of U.S. carriers into Canada are included in domestic reports to CAB, in accordance with CAB filing procedures.

U. S. International Airline Revenues and Expenses, Quarter Ending June 30, 1953

AIRLINES	TOTAL OPERATING REVENUES	PASSENGER REVENUES	U. S. MAIL REVENUES	FOREIGN MAIL REVENUES	EXPRESS REVENUES	FREIGHT REVENUES	EXCESS BAGGAGE REVENUES	NON-SCHEDULED TRAMP REVENUES	TOTAL OPERATING EXPENSES	AIRCRAFT OPERATING EXPENSES	GROUND & INDIRECT EXPENSES	NET OPERATING INCOME BEFORE INCOME TAXES
American	\$ 1,191,350	\$ 964,078	\$ 21,063	\$ 21,320	\$ 462	\$ 131,882	\$ 14,973	\$	\$ 1,151,283	\$ 532,776	\$ 618,507	\$ 40,067
Braniff	2,086,820	1,388,323	504,669	52,763	. . . .	92,988	42,067	. . . .	2,378,104	1,198,564	1,179,540	-291,284
C & S *	350,593	227,628	82,817	1,030	. . . .	29,683	7,276	. . . .	324,675	156,123	168,552	25,918
Colonial	912,817	867,954	14,994	4,536	. . . .	5,444	5,324	4,053	804,955	380,024	424,931	107,862
Delta-C&S **	652,462	571,164	10,116	2,838	. . . .	42,441	24,464	. . . .	664,047	328,424	335,623	-11,585
Eastern	2,696,542	2,099,363	71,009	. . . .	. . . .	41,644	32,993	451,439	1,683,555	1,063,890	619,705	1,012,987
National	768,903	715,018	7,902	. . . .	3,539	24,960	17,884	. . . .	962,839	421,794	541,045	-193,936
Northwest	4,950,912	2,649,597	1,208,832	147,023	17,697	833,175	42,974	. . . .	4,431,696	2,059,915	2,371,781	519,216
Panagra	4,168,480	2,746,255	625,500	244,537	. . . .	317,873	103,288	5,277	3,962,225	1,662,319	2,299,906	206,255
PAA	16,375,836	11,700,805	1,806,213	374,617	. . . .	1,897,742	282,683	72,226	17,068,558	7,481,394	9,587,464	-693,022
Latin Amer.	19,647,288	14,192,508	3,066,600	669,819	. . . .	1,224,851	312,988	72,617	19,134,683	9,244,852	9,889,831	512,605
Atlantic	12,161,924	7,563,240	2,849,697	378,326	. . . .	901,580	141,883	158,054	10,438,007	6,078,865	4,359,142	1,723,917
Pacific	1,933,638	1,019,023	391,300	. . . .	. . . .	345,283	11,558	162,325	1,668,044	803,256	864,788	269,594
Alaska												
TWA ***	14,640,112	11,747,845	816,810	717,405	. . . .	870,914	286,581	54,127	12,796,225	6,137,919	6,658,306	1,843,887
United	2,138,244	1,980,185	83,168	. . . .	. . . .	36,128	16,794	. . . .	2,452,099	1,404,755	1,047,344	-313,855
TOTALS	84,675,921	60,432,986	11,560,290	2,614,214	21,698	6,796,558	1,343,730	980,118	79,921,295	38,954,830	40,966,465	4,754,626

* Figures are for April only, since company merged with Delta Air Lines on May 1, 1953.
 ** Figures are from May 1, 1953, effective date of merger between Delta Air Lines and Chicago and Southern Air Lines.
 *** Compensation for carriage of U.S. mail has been paid on basis of temporary rates.

U. S. Domestic Airline Traffic, August, 1953

AIRLINES	REVENUE PASSENGERS	REVENUE PASSENGER MILES	AVAILABLE SEAT MILES	PASSENGER LOAD FACTOR %	MAIL TON-MAILES **	EXPRESS TON-MAILES	FREIGHT TON-MAILES	TOTAL TON-MAILES	REV. TRAFFIC TON-MAILES	AVAILABLE TON-MAILES	% AVAILABLE TON-MAILES	REVENUE PLANE MILES	SCHEDULED MILES	% SCHEDULED MILES
American	529,780	310,342,000	460,001,000	67.47	1,355,098	812,018	4,363,009	36,056,413	61,194,757	58.92	9,474,946	9,501,245	99.30	
Braniff*	104,392	40,484,000	76,474,000	52.94	146,515	96,151	200,932	4,315,956	8,241,454	52.37	1,999,200	1,992,830	99.68	
Capital	212,962	66,685,000	112,558,000	59.25	180,996	219,952	263,432	7,036,845	15,212,677	46.26	2,670,572	2,631,181	99.01	
Caribair	10,554	880,000	1,444,000	60.94	861	• • • •	1,446	82,283	152,160	54.07	58,954	56,750	99.87	
Colonial	41,430	10,091,000	16,889,000	59.75	12,077	8,547	24,437	983,852	1,852,897	53.10	466,671	406,993	99.39	
Continental	33,770	14,086,000	27,294,000	51.61	47,587	14,847	74,467	1,436,720	3,462,720	43.93	734,881	720,400	99.66	
Delta-C&S	134,654	55,772,000	93,226,000	59.82	230,962	193,347	463,425	6,231,592	11,117,720	56.05	2,514,682	2,508,334	99.88	
Eastern	280,681	179,899,000	312,931,000	57.49	454,319	316,151	618,522	19,568,467	41,647,180	46.99	5,700,318	5,648,039	99.51	
Hawaiian	49,574	6,591,000	9,878,000	66.72	1,916	• • • •	126,613	654,593	1,341,236	48.80	324,862	229,164	99.85	
National	63,185	43,442,000	65,679,000	66.14	105,196	46,327	434,272	4,980,088	7,839,557	63.53	1,360,461	1,346,507	98.27	
Northwest	66,949	13,313,000	21,054,000	63.23	11,950	13,604	27,180	1,258,437	2,076,073	60.62	692,450	709,811	99.19	
Northwest	104,444	75,923,000	115,063,000	65.98	274,605	162,212	272,653	8,001,845	13,179,213	60.72	1,907,976	1,907,126	99.24	
Trans Pacific	19,855	2,462,000	3,953,000	62.28	1,987	29	5,970	189,585	328,641	57.69	141,149	109,064	100.00	
TWA	274,253	233,108,000	308,160,000	75.65	1,020,930	589,965	1,413,764	25,309,910	37,562,289	67.38	5,918,226	6,007,077	98.04	
United	388,753	257,658,000	351,179,000	73.37	1,334,355	756,653	2,098,084	28,306,562	50,662,100	57.10	7,435,902	7,559,181	96.28	
Western	79,346	36,063,000	54,352,000	66.35	127,904	61,076	105,197	3,736,508	5,960,502	62.69	1,258,126	1,275,787	98.53	
TOTALS	2,494,551	1,346,799,000	2,030,135,000	66.34	5,357,256	3,290,879	10,493,403	148,819,676	261,831,201	56.34	42,659,376	42,609,485	99.49	

* Braniff's figures do not include operations of local service route.
** Mail ton-mile figures include air parcel post.

NOTE: Above figures include both scheduled and non-scheduled operations.

INTERNATIONAL AVIATION

Edited by Anthony Vandyk



INTERCOM

The Norwegian government's decision not to renew the license of Norwegian independent Braathens SAFE for the Norway-Far East route comes at the same time that reports are circulating that the Icelandic airline Loftleidir is planning a service to the Far East. This is not surprising since there has long been a close association between the two carriers and an interchange of their combined long range aircraft fleet of two DC-4's for the operation of Braathens' Far East route and Loftleidir's cut-rate trans-Atlantic service. Whatever plans Loftleidir may have for Far East operations, the termination of the Braathens service as such at the end of February will mean that Scandinavian Airlines System will be the only Scandinavian carrier operating scheduled flights to the Far East. Moreover, it will enable SAS to serve Hong Kong, where the British authorities grant traffic rights to only one Scandinavian carrier (at present Braathens).

Although the end of the Braathens operation to the Far East will be helpful to SAS, developments are less satisfactory in the three-nation airline's program to fly to Japan from the east in addition to the present route from the west. To do this SAS would like to use the U. S. Air Force's base at Thule, Northern Greenland. Permission for the use of this base for the projected SAS service to the U. S. West Coast is reported to have been refused—at least temporarily—by the U. S. government, and Bluie West 1 or 8, further to the south, have been offered as substitutes. Furthermore—and this is the hardest blow for SAS—indications are that the U. S. government has denied the airline the use of Los Angeles as its terminal on the west coast and suggested Seattle in its place. The Scandinavian airline is reported not to be impressed with any of the proffered substitutes, particularly Seattle, and is expected to fight hard (through diplomatic channels) to persuade the U. S. government to change its mind.

Soviet Expects Travel Increase

The Soviet Union anticipates an increase in traffic to and from Russia. This was the reason behind a recent visit of two Scandinavian Airlines System officials to Moscow at the request of Aeroflot, the Russian airline. The Soviet carrier requested certain revisions of the current traffic agreement between Aeroflot and SAS, and, as a result of the discussions, it was agreed to increase the frequency of the Stockholm-Helsinki-Moscow route from twice to three times weekly. This increase has now taken place. SAS continues to fly the Stockholm-Helsinki sector and

Aeroflot the Helsinki-Moscow stage.

The SAS officials also signed a supplementary agreement on transit traffic to a number of points in the Far East such as Peking. At the same time Aeroflot adjusted its schedules so as to give passengers to and from destinations east of Moscow direct connections.

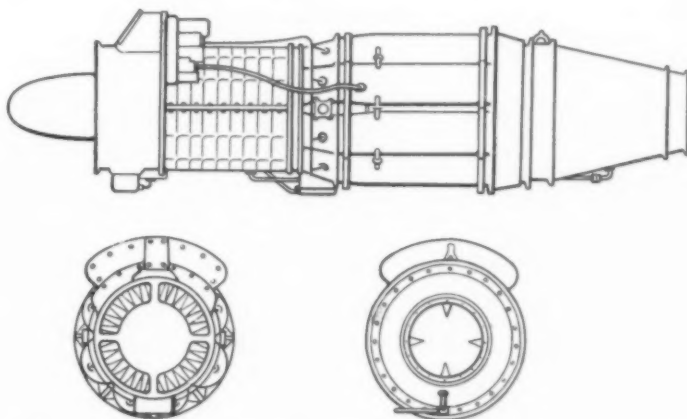
Before World War II it was possible to buy a round-the-world ticket with travel rights across the Soviet Union, and in August, 1939, AB Aero-transport, now the Swedish component of SAS, operated Stockholm and Moscow each weekday.

India May End Bilateral with U. S.

Termination of the 1946 air transport agreement between the United States and India has been recommended by the Indian Ministry of Communications, according to a reliable report from India. Discussion of this recommendation and a final decision by the Indian cabinet is expected soon. The main effect of termination of the bilateral would be the cancellation of the traffic rights of U. S. airlines operating in India (PAA and TWA.)

Background to the ministry's recommendation is the failure of talks initiated early this year at the request of

the Indian government for the purpose of revising the agreement. The Indians wanted to include in it a provision empowering India to regulate the capacity and frequency of U. S. airlines operating into India. Although the absence of such a provision has not in any way affected Indian interests, New Delhi apparently insists that it is desirable to have one in order to bring the U. S. bilateral into line with similar agreements existing between India and some other countries. No Indian carrier operates to the U. S. or has definite plans to do so.



Japan's first postwar jet engine, the Omiya Fuji JO-1 is scheduled for completion by next fall. Designed by Omiya Fuji Industries, Omiya, formerly a component of Nakajima Aircraft, it is basically an improved version of the Ne-20, which was copied from the German BMW 003 for Japan's first jet, the "Kikka." The JO-1 is an axial-flow engine with eight compressors and a single-stage turbine. Static thrust is reported to be 2200 pounds. Length, 110.2"; width, 26.7"; dry weight, 99.2 pounds.

INTERNATIONAL AVIATION

MILITARY

SOVIET UNION: Some 80 long range bomber airfields and about 60 rocket-firing bases (each with six launching ramps) are being built in the Brest-Litovsk and Bialystok area near the Russian-Polish border. They are scheduled for completion by the end of 1954.

JAPAN: The Maritime Security Force has ordered six more Sikorsky S-55 helicopters to supplement the original order for two.

CANADA: Creation of an RCAF bomber force is under consideration.

AUSTRALIA: RAAF will activate its Canberra jet bomber squadron by the end of the year.

ETHIOPIA: An additional 20 Saab-17A attack aircraft for the Ethiopian Air Force are being supplied from Swedish Air Force surplus at about \$6,000 each. Ethiopia has bought a total of 56 Saab-17A's.

NORWAY: Night fighters are being sought by the Norwegian Air Force, with preference for the de Havilland Venom 3.

MANUFACTURING

SOVIET UNION: Production of the four-engine Mi-13 (Type 31) bomber is behind schedule and only an estimated 125 of the planes have been produced to date. Construction of 400 by the end of this year, with a monthly production of 25, was scheduled. In July, however, only 12 aircraft were built. In the light bomber category Russia has switched production from the Il-28 to the Il-28-2, a swept-wing version of the original model.

ITALY: Fiat is to build a batch of G-82 trainers (powered by Rolls-Royce Nene) for the Italian Air Force. Company will be the main beneficiary from an Italian government decision to spend \$15 million on the license production in Italy of the North American F-86K (in addition to funds provided by the U.S. under the off-shore procurement program). Macchi and SIAI-Marchetti will be involved as subcontractors.

FRANCE: SNCA du Sud-Ouest has designed a low-speed tactical aircraft known as the SO 7100 Dogue. Firm's SO 1220 Djinn helicopter is to undertake a high-altitude test program for the French authorities.

SNCA du Sud-Est's SE 3120 Alouette helicopter would sell at \$57,000 based on a production run of 100. It would cost about \$1 million to get production rolling.

Morane Saulnier will cooperate with Fouga in the production of 100 Fouga 170R Magister jet trainers for the French Air Force.

BRITAIN: A Vickers-Armstrongs design for a high-wing turboprop transport would be powered by four 4000-shp Rolls-Royce twin-spool axial engines of about the same size as the Dart. BEA is interested in ordering the model for introduction in 1958 or 1960.

An 80 to 90-shp boost in the Rolls-Royce Dart's power will enable the cruising speed of the Vickers Viscount 700 series to be increased by 18 mph with a reduction in fuel consumption, thereby improving operating costs per ton-mile by between 4¢ (for stages of up to 800 miles) and 15¢ (for a 1600-mile stage).

AIRLINES

BRITAIN: An "initial order" for five de Havilland Comet III's with "further options" brings BOAC purchases of Comets to 25 aircraft. The five Comet III's will be used on the North Atlantic run.

IRELAND: Aer Lingus' monopoly on services to Britain may be terminated as a result of talks initiated by the United Kingdom government on the revision of the 1946 bilateral. BEA owns 40% of the Irish airline but is liable for 50% of the losses on all its routes.

CANADA: Canadian Pacific Airlines' application to operate a transcontinental all-cargo service has been rejected by the Canadian government. CPA may order six Comet III's in addition to its recently ordered three Comet II's (and an option on a fourth). Latter are scheduled for delivery starting next September and will fly the Vancouver-Tokyo and Vancouver-Lima routes.



Italy's first lightweight fighter will be developed from the SAI-Ambrosini Sagittario, a wooden prototype powered by a Turbomeca Marbore (photo above). It will be an all-metal plane with a Rolls-Royce Derwent.

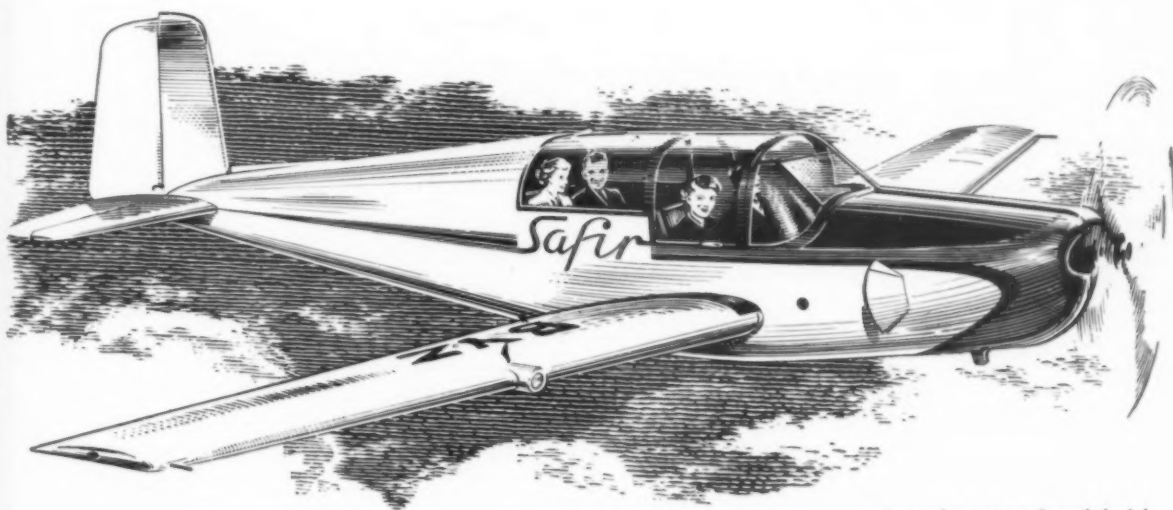


Something New in the Air

Saab-91 Safir now a four-seater

The well-known *Saab-91 Safir* 3-seat all-metal training and touring aircraft is now available in a new and comfortable 4-seat model — the *Saab-91C*. Especially designed for executive and pleasure travel as well as for taxi and feeder use, the new Safir is also equally suitable as

a light "utility" or ambulance transport. By removing the rear seats, a quarter-ton cargo can be easily carried. Like its predecessors, the 91A and the improved 91B Safir versions now in use with several air forces and government flying training schools, the 91C Safir can also be used as a primary trainer up to the more advanced stage of jet training. All this makes the new Safir one of the world's most versatile light aircraft.



A stretcher case can be easily loaded into the Safir. The new model 91C can also accommodate a medical attendant

SAAB-91C SAFIR

Four-seat light aircraft



Power . . . one 190 h.p. Lycoming 0-435-A "flat six" aircooled engine driving a v.p. propeller.
Span . . . 10.6 m (34 ft. 9 in.)
Length . . . 7.95 m (26 ft.)
Wing area . . . 13.6 m² (146 sq. ft.)
Weight Empty . . . 745 kg (1,650 lb.)
Gross Weight . . . 1,215 kg (2,686 lb.)
Max speed . . . 270 km/h (168 mph)
Cruising Speed (Sea Level) 240 km/h (150 mph)
Service ceiling . . . 5,100 m (16,800 ft.)
Normal range . . . 900 km (560 miles)
(All figures relate to 1,215 kg (2,686 lb.) weight)



SVENSKA AEROPLAN AKTIEBOLAGET (SAAB AIRCRAFT COMPANY) · LINKÖPING · SWEDEN

DECEMBER 7, 1953

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over 200 mph for your DC-3

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Md. Precision Instrument & Optical Co.
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Mtl. 5-47891—since 1930—Baltimore 2, Md.

WANTED: Aggressive sales manager for certificated local service carrier. Send application to Keith Kahle, Central Airlines, Meacham Field, Fort Worth, Texas.

TWIN BEECHCRAFTS

C18S and D18S Transports—Excellent Condition fully equipped from \$25,000
LODESTAR EXECUTIVES
Why take less for your money?
Ready to go complete from \$55,000
We Invite Inquiries for Any Types
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AIRLINE TRAFFIC EXECUTIVE. Position as general traffic and sales manager open for experienced traffic executive desiring opportunity for increased responsibilities. Company is certificated American flag carrier operating in U.S. territory and internationally. Address replies, giving detailed experience in traffic, sales and public relations, to Box 836, AMERICAN AVIATION Magazine, 1025 Vermont Avenue, N.W., Washington 5, D. C.

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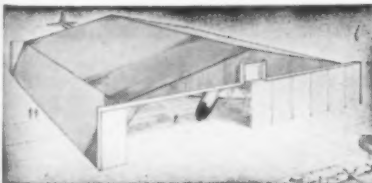
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Advertisers Index

Aero Design & Engineering Company	70
Aerotherm Corporation, The	67
Air Associates, Inc.	97
AiResearch Manufacturing Company, Division of the Garrett Corporation	34
Air Parts Incorporated	78
Allison Engine Division, General Motors Corporation	79
American Cystoscope Makers, Inc.	65
Beech Aircraft Corporation	68
Bell Aircraft Corporation	74
Bendix Aviation Corporation, Scintilla Magneto Division	3
Eclipse Pioneer Division	93
Braniff Airways, Inc.	72
Bulletin Board (Classified)	90, 91, 92
Champion Spark Plug Company	41
Cities Service Oil Company	76
Collins Radio Company	5
Curtiss-Wright Corporation	61
Douglas Aircraft Company, Inc.	19
Esso Export Corporation	21
Fairchild Engine & Airplane Corporation, Fairchild Aircraft Division	65
Stratos Division	53
Federal Aircraft Works	40
Flightex Fabrics, Inc.	81
General Electric Company	52
Gilfillan Bros.	8
B. F. Goodrich Company, The	12
Hertz Drive-Yourself System, Inc.	96
Hollywood Roosevelt Hotel	82
Jack & Heintz, Inc.	42, 43
Kollsman Instrument Corporation	83
Land-Air, Incorporated	35
Lear, Inc.	7
Lockheed Aircraft Corporation	10, 11
Minneapolis-Honeywell Regulator Company	2
Monsanto Chemical Company	95
North American Aviation, Inc.	75
Northrop Aircraft, Inc.	55
Northwest Airlines, Inc.	23
Pan American-Grace Airways, Inc.	57
Phillips Petroleum Company	98
Pratt & Whitney Division, United Aircraft Corporation	46, 47
Scandinavian Airlines System	33
Service Parts Systems, Inc.	82
Spartan Aircraft Company, Aviation Service Division	73
Standard Piezo Company	81
Summers Gyroscope Company	48
Surface Combustion Corporation, Janitrol Aircraft-Automotive Division	80
Svenska Aeroplan AB (Saab Aircraft Company)	89
Temco Aircraft Corporation	60
Texas Metal & Manufacturing Company, Inc.	65
Titeflex, Inc.	63
Trans World Airlines, Inc.	62
Western Air Lines, Inc.	45
Westinghouse Electric Corporation	58, 59
Wilcox Electric Company, Inc.	69

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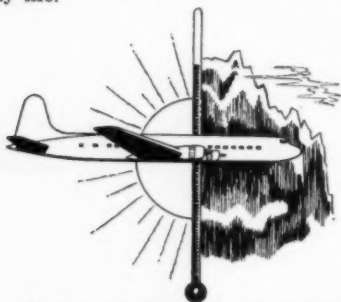
En Route



Yodel-Bound. This is about Switzerland and the tough life I lead.

Here I was enjoying the wonderful Washington summer with temperatures only up to 100 or so when all of a sudden some very kind folks connected with the government of the Canton of Zurich invited me to come over there for the dedication of a new airport terminal.

This was a call to duty, no less. I love airport dedications when they're over 3000 miles away, so at great personal sacrifice I deprived myself of the tail end of one of the hottest, muggiest, goshawful summers Washington has ever had, and hied myself up to New York to hop on Swissair to undergo the hardships of this affair in Zurich. The only mistake I made was not taking off 10 pounds before leaving, because I've never run into so much luscious food and hospitality in such a short time in my life.



It was my first trip on Swissair. Not having been born yesterday when it comes to airline schedules I picked out the once-a-week first class flight even though it got me into Zurich about five days ahead of the dedication. You'll never catch me slumming if I can help it!

Swissair. I can give you a good report on Swissair. It was a DC-6B with lots of passenger comfort and equipped with those footrests which extend out from the seat so you can stretch out your legs and get a good sleep. Since Swissair has only one weekly first class flight, the rest being tourist, it has done a good job of setting up a first rate passenger service.

Not quite as de luxe, perhaps, as several of the other carriers, but certainly okay. For myself I can dispense with some of those super-extra trimmings which some carriers lay on. What I like to see is a high standard service that operates on time.

What turned out to be a real thrill,

to me, was the rapid transition from New York to the heart of Europe. We made only one stop at Gander, Newfoundland, and then flew in 9 hours and 15 minutes direct to Geneva. That's good flying. We left New York at 3:20 p.m. and arrived in Geneva at 6 a.m. New York time and in Zurich by 7:15, and skipped all of the traditional European gateways such as Shannon, Prestwick, London, and Paris.

On the way to Gander we had dinner. Just a light snack of about 10 courses. We started with salmon with some fancy sauce and went on to clear oxtail soup which must have been awfully good because I wrote "very good" on the side of my menu. The main course was veal but the *pièce de résistance* was the sauce for the artichokes because my notes say it was "excellent" and believe me, food has to be awfully good before I rate it that highly.

I noted that the dessert was "very good"; it was called Coupe Denise and mighty rich. Then came Swiss cheese and fruit. The wine was a light white Swiss variety which I found delicious. Before I left Switzerland I became a great fan of those light Swiss wines and champagnes.

Good Food. I mention this beautiful array of food because I've started carrying my own lunch basket on U.S. domestic flights. I'm getting so I hate the sight of those half-size standard ham and cheese sandwiches and an old wrinkled apple that some lines puckishly call "snack." On the Atlantic you really get a feed, especially on the first class flights. But I've never had a poor meal on a trans-Atlantic tourist flight, either.

These Swiss are as orderly in running an airline as they are in making watches and operating the world's finest railroad system.

For one thing you get a seat card when you check in which not only gives you your seat number but has a diagram of the cabin layout with your seat location checked off. For another, each passenger on first class flights gets the most elaborate hard-covered kit of assorted literature, information, note pads, stickers, Swiss street maps, tourist data, currency and custom hints, and the like that I've ever seen.

Trans-Atlantic lines don't do enough selling of European vacation spots; the literature is good reading on the way over when the passengers have a sense of anticipation anyway. Swissair gives a less elaborate, but still useful, kit to tourist passengers.

As many times as I've flown the

Atlantic I don't think I'll ever cease getting a kick out of arriving in Europe. You leave crowded, dirty, noisy New York, you make a stop up in the wilds of Newfoundland, get some sleep, and then you're on the other side.

This trip was especially good because we flew right on past the southern tip of England and high over Paris and right on until we approached the beautiful snow-covered Alps on a fine morning and circled over Lake Geneva to land at Cointrin Airport far in the interior of the Continent. How people can fritter away their time on a boat I'll never understand.

Anti-Freeze Reception. At Zurich the fine new terminal was already in operation. Customs and immigration were fast. So in no time at all I was in a taxi headed for the Dolder Grand, which sits high on the side of a hill overlooking Zurich and the lake.

Some folks say the Dolder Grand is the finest hotel in Europe. I won't go quite that far because Europe has some very fine inns, but I certainly admit that the Dolder is one of the best on the Continent. For those who are in Zurich only a day or two the Baur-a-lac in the heart of the town is absolutely top-notch and more convenient. If you have the time, or if you have your own car, the Dolder is fine.

But watch those martinis! The Dolder bar hasn't seen a bottle of vermouth in the past century. Those mar-



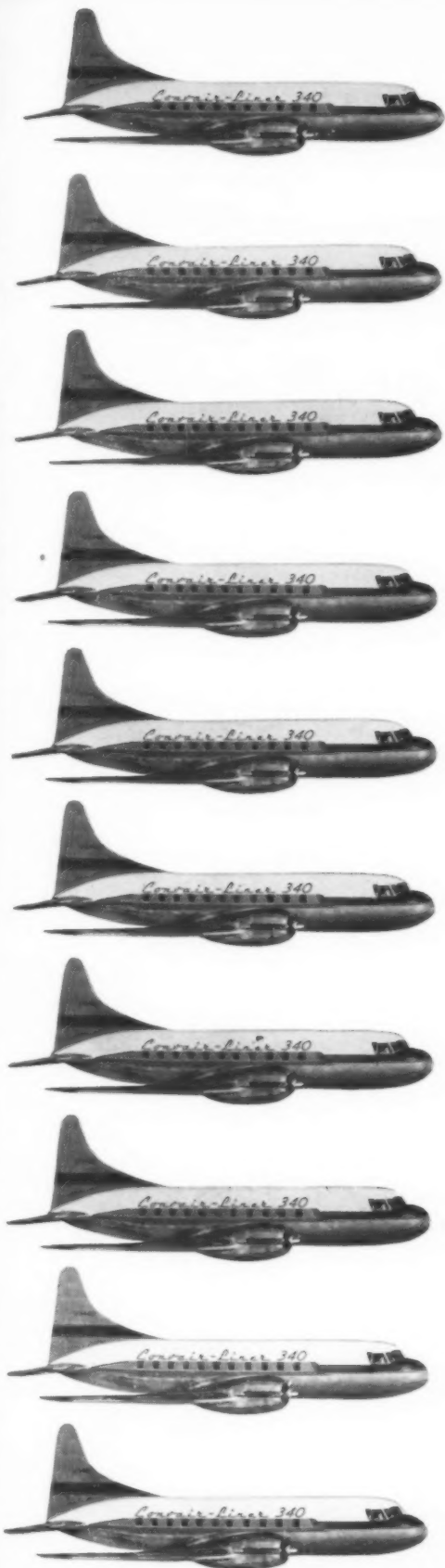
tinis are absolutely the very best, the smoothest, and the most deceptively dangerous martinis in all this world.

My first night in Zurich proved to be the most rigorous testing base for anti-freeze I've come up against for a long time. There was H. G. A. ("John") Meili, TWA sales manager for Switzerland, Nils Olsson, the SAS manager. Dr. Ernest Altorfer, director of aviation for Zurich, and that experienced host, G. Henry Kraehenbuehl, manager and owner of the hotel, who was actually born in Kansas City, Mo.

The martinis merged into Danish aquavit (a liquid form of explosive), then into Kraehenbuehl's favorite Swiss champagne, plus a very fine special dinner dreamed up by the fatter, topped with madeira wine and cognac and gosh knows what. Not only was I the first arrival for the airport terminal festivities but I came close to being the first out!

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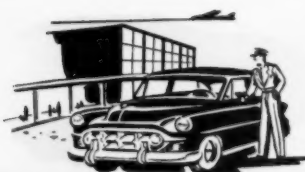


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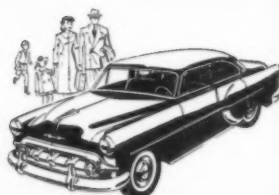
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Red Air Power 95% Short Range: Twining

Russian air strength is 95% short-range bombers and fighters, Air Force Chief of Staff Nathan F. Twining told the Dallas Council on World Affairs' airpower symposium. Because of this, the U. S. must build up its long-range aircraft "to strike our heaviest blows from bases outside the range of these thousands of short-range aircraft," he emphasized.

He said the Russians "are already producing a new fighter superior to the MiG." Twining added that through USAF production of the North American F-100 "we are beginning to match the new Soviet advance."

Mail to Fly Lowest Cost Lines: PO

The Post Office Department has told 11 airlines that where there are competing services between cities it intends to give the mail to the carrier with the lowest air mail rate.

In a new and controversial policy statement, the PO also said that where there are mileage differences between cities it will use the airline with the most direct route. Both policies, which the PO estimates will save it \$300,000 to \$500,000 yearly, are effective January 1 and will apply in all instances where mail deliveries will not be delayed.

John C. Allen, Assistant Postmaster General-Transportation, told the airlines that the PO "has been concerned for some time with the instances wherein we feel we pay a premium in air mail transportation service via one carrier when similar service and lower costs are obtainable by another air carrier."

One CAB staff official asserted that the PO was making a "basic attack on the entire rate structure" and that the entire mail pay picture might have to be re-examined. An industry air mail official said the result will be "chaos."

Airlines now receiving 53¢ a ton-mile service rate for mail will probably be forced to accept 45¢ on routes where they compete with the present 45¢ carriers. If the 53¢ lines petition CAB to lower their rates to 45¢ on competitive routes, so as not to lose their mail loads, the Board could grant the adjustment temporarily to prevent them from being harmed. Beyond this, however, CAB officials indicated they're not sure

what course they can follow. Presumably, the PO move could force some carriers back to a subsidy status.

The PO letter was sent to the six 53¢ carriers (Capital, Braniff, Delta-C&S, National, Northwest and Western), the four 45¢ lines (American, EAL, TWA and UAL), and Pan American World Airways.

On the subject of mileage differences, a PO spokesman said that the department pays on an airport-to-airport basis. Thus, for example, Chicago-Seattle mail costs more if sent on UAL via Denver than if it goes on NWA direct.

Policies Formulated For AMC and ARDC

Policies and procedures for the development and production of weapons systems and supporting systems of the Air Materiel Command and the Air Research and Development Command have been "spelled out" in the new Air Force Regulation 70-9, dated November 12, 1953.

AMC's responsibilities include weapon system development, selection of contractors for production, and maintenance of close surveillance of factors relating to procurement, production, maintenance, and other logistic considerations during weapon system development progress and production. ARDC will maintain close surveillance of all engineering aspects of weapon system development.

BOAC Orders Comet III's

De Havilland has revealed a BOAC "initial order" for five Comet III's, with options for more. BOAC Comet purchases now total 25.

Westinghouse to Center Jet Work in Kansas

Westinghouse Electric Corp. has received permission from the Navy Bureau of Aeronautics to consolidate all of its jet engine production at its Kansas City plant, thus eliminating the Lester, Pa., facility as jet producer. Move, however, will be gradual and will extend until 1955. Independent Electrical Workers Union, representing 2600 workmen at Lester, is fighting the transfer.

Quarles Urges More Flexible Administration

Assistant Defense Secretary (Research and Development) Donald A. Quarles has cited a need for greater flexibility in military R&D administration in a talk before the Stanford Research Institute at San Francisco.

Noting the present system of budgeting, appropriating, obligating, and then performing "is not as flexible as good R&D administration would call for," Quarles pointed out that one of his present plans is to make the system as flexible as possible within overall government limitations.

Quarles also asked for a "reasonable effort" toward a tight continental defense, emphasizing the term "reasonable" because he feels "it would be unreasonable to sink large sums into obsolescent arrangements when much superior ones are in the offing." He said reports that the country "was caught napping" on a substantial continental defense program are "wholly unfounded."

Ramsey Sees Slump

A downward trend in aircraft production can be expected next year, according to DeWitt C. Ramsey, president of the Aircraft Industries Association. By the middle of 1956, Ramsey estimates, the industry will be operating "substantially" below the current 1000-planes-a-month rate.

Three Soviet Units Get Six-Engine Bomber

Three operational units of the Soviet air force are now equipped with six-engine TuG-75 bombers, while production of the four-engine Mi-13 (Type 31) bomber is lagging behind schedule. It is estimated that only 125 of the latter have been produced so far.

MATS May Adopt MSTs Billing System

The Air Force, which manages the Military Air Transport Service, is studying the possibility of changing MATS to an operation similar to the Military Sea Transportation Service, which bills each of the armed forces for passengers carried and cargo shipped.

Strike at P & W Seen Possibility

Possibility of another aircraft industry strike—against four Pratt & Whitney engine plants in Connecticut—arose as P&W's contracts with the AFL-Machinists expired. Union members gave their negotiators permission to call a walkout and a company offer of nine cents an hour was turned down.

The CIO-Autoworkers have been negotiating with P&W for a first contract at a fifth P&W plant. Thus the two unions might begin concerted action against the United Aircraft Corp. division, thus shutting down production of J57's, T34's, and R-2800 and R-4360 piston engines.

Meanwhile the UAW strike against three North American Aviation plants continued even though more than one-third of the 33,000 who quit work October 22 were back on the job. John W. Livingston, UAW vice president and head of the union's national aircraft department, took over the union's negotiations with NAA.

Elsewhere, the IAM's contract with Consolidated-Vultee at San Diego expired but negotiations continued and Machinist talks with Douglas-Santa Monica and Lockheed-Burbank went on. IAM locals, however, were apparently waiting to see what the UAW's ultimate contract with NAA provides.

Cargo Handling Methods Antiquated: Hackney

Antiquated ground handling procedures, comparable to those "practiced by Columbus in 1492 . . ." are, according to L. R. Hackney, executive vice president of Transport Air Group, the association of airfreight and airlift carriers, "the 'mighty trifles' that can seriously jeopardize the future position of the air transportation industry in the national transportation program."

Furthermore, Hackney complained, in an address before a section meeting of the Institute of the Aeronautical Sciences in Hagerstown, Maryland, there are no figures available today which break down the indirect costs attendant to airfreight in a manner comparable to those employed in direct flying cost calculations.

Hackney stated, "It is my firm conviction that some day we will see detachable pack airplanes flying scheduled domestic route patterns on military and civil operations, and that the overall cost figures will allow a rather sizable increase in direct operating costs, provided advantage is taken of the many loadability features, both tangible

and intangible, that can be reflected favorably on the indirect operating cost side of the picture."

To solve the problem of just what are the indirect costs to be considered and included in preparing an overall system analysis, the speaker proposed formation of a committee composed of representatives from the airframe manufacturers, carriers interested in airfreight, and technical personnel of the military, and warned against approaching the problem entirely from an engineering viewpoint.

Industry Management Controls Future: Denny

CAB Vice Chairman Harmar D. Denny, echoing the new Administration's back-to-private-ownership theories, has advised airline management that the industry's future depends "almost entirely" on decisions, policies, and planning of top management.

Although indicating that CAB will not relinquish any of its responsibilities under the Act, Denny said the Board will stand "somewhat farther behind than heretofore so as to help our airlines become more self-reliant and attain a more independent business economy."

Speaking in Dallas before the Symposium on Air Power, Denny continued: "There have been times in the past when weakness in top level management—and financial mistakes caused by that management—were glossed over in the sure knowledge that an air mail subsidy increase would take care of everything. Those days are gone forever."

Since the industry has fought off potential CAB fare investigations in the past year, significance was attached to Denny's remark that "the majority of the Board feel the fundamental economic conclusion deriving from the 15-year history of regulation that fare levels should not be shifted to meet each swing of the pendulum, even though the swing at the present time is on the plus side for the trunk airlines."

Air France Board Approves HD 32 Order

Approval has been given by Air France's board of directors for the purchase of 24 Hurel Dubois HD 32 "DC-3 replacements" for use in French territories in Africa and in Madagascar. Deliveries are expected to start in mid-1956. Hurel Dubois is also negotiating for a large order from the French government and production planning is in terms of an initial run of some 150 aircraft.

DC-7 Transcontinental Flights by NAL, AA

New Douglas DC-7's of National Airlines and American Airlines spanned transcontinental routes in record and near-record times on pre-inaugural flights operated Thanksgiving week.

National, taking delivery of its first DC-7 at Santa Monica, Calif., broke the Los Angeles-Miami transport speed record, making the flight in 5 hours, 50 minutes, 13 seconds. Eastern Airlines set the old record in 1947 when a Constellation flew the route in 6 hours, 25 minutes.

Meanwhile, in two round-trip inaugural press flights, American made one eastbound hop in 6 hours, 38 minutes, and the second in 6 hours, 31 minutes.

All flights were performed at altitudes ranging from 21,000 to 25,000 feet. With tailwinds described officially as "below average" for this time of year, National attained an average speed of 401 miles per hour, American 380 mph on one flight and 390 mph on the other. Speeds well in excess of the averages were reached at various intervals en route.

American put its first DC-7 into service on transcontinental routes on November 29. National is scheduling its first service for December 15, on its New York-Miami route.

C-46 'Interim Standards' Extended

The CAB has granted a three-month extension of the so-called "interim standards" applicable to Curtiss C-46 aircraft. The C-46, mainstay of the non-scheduled industry, otherwise would have been forced to comply with transport category requirements of the Civil Air Regulations on January 1, 1954. New deadline is March 31, 1954.

PAL Holds on to Remaining 340's

Sale of six Convair 340's has been held up by Philippine Air Lines after one of the aircraft was sold to the Union Oil Producing Co. of Shreveport, La. The remaining five will be used on PAL routes in the Orient. Two are now in operation, one is due in December, and two more are scheduled for delivery early next year.

AFA Membership Climbs

Merger of the Air Force Association with the Air Reserve Association has increased AFA's membership some 2400 members, bringing its total membership to more than 37,000.

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MY COUNTRY, 'TIS OF THEE

WITH FREEDOM'S HOLY LIGHT...



A place to worship one's God . . .

to maintain one's faith . . . unhindered . . . to express opinions, confident that any may disagree with
what you say, but will defend to the death your right to say it.

This is the strength of a mighty nation . . . whose natural resources

and giant industries . . . are incomparable assets

to the world at large . . . and to peace within our time.

This is America . . . Let's preserve it!

Character is the vital measure of a nation's strength and stability . . . and as with the state, so it is with those who contribute to its maintenance and safety. ➤ By 1927 American aviation had begun to fulfill the promise of its ultimate stature in defense, transportation and business utility. ➤ Air Associates, comprised of research and development, manufacturing and marketing was founded in answer to those needs. ➤ Today, the character of our organization is the motivating force which makes available the finest aviation products the world has ever known.



TETERBORO, NEW JERSEY

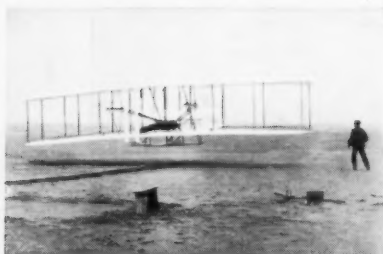
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Air History in the Making

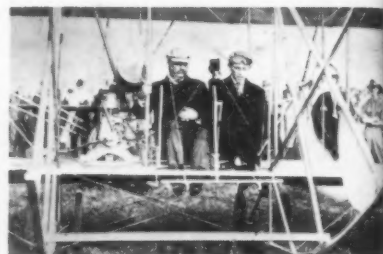
The pioneering days of aviation helped chart the course of today's great aeronautical achievements! Pictured here are some of those pioneer fliers whose genius and daring helped write the early chapters in aviation's history.



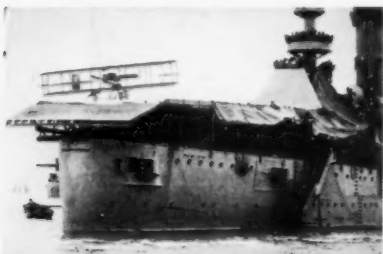
At Kitty Hawk, North Carolina, powered flight began on Dec. 17, 1903, when Orville and Wilbur Wright flew over the sand dunes for 12 seconds.



Glenn Curtiss first exploited lateral control effected by ailerons in 1908. In his pusher plane, the June Bug, he got off the ground at 150 feet!



"Arch" Hoxsey, a member of the first Wright flying team, took ex-President "Teddy" Roosevelt up for a flight over St. Louis in October, 1910.



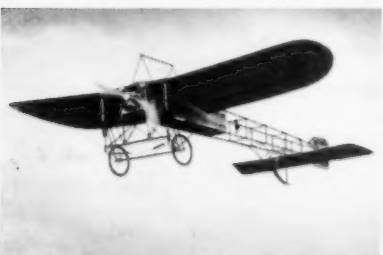
Eugene Ely made the first successful landing on a ship at sea on January 18, 1911, when he "put down" on the quarter deck of the U.S.S. Pennsylvania.



Lt. M. S. Crissy of the U. S. Army and Phillip O. Parmalee released the first explosive from a U. S. airplane in January 1911, near San Francisco.



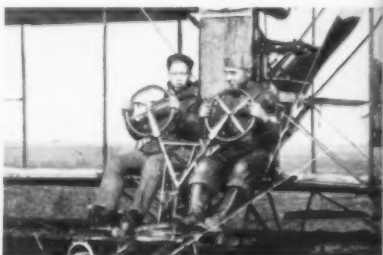
Calbraith P. Rodgers became the first man to fly cross-continent when he flew from Mineola, Long Island, N. Y., to San Diego, Calif., late in 1911.



Earl Ovington, pioneer aviator, back in 1911 made the first official United States Air Mail flight from Garden City to Mineola, Long Island, N. Y.



Lincoln Beachey, aerial stunt-man and daredevil, raced his pusher plane in 1914 against auto speed demon Barney Oldfield, at fairs and expositions.



Billy Parker, in 1914, taught flying from the left hand seat of his dual control pusher plane to students qualifying for The Aero Club's pilot's license.

From aviation's earliest beginnings, high performance standards of aircraft have depended on high performance fuels.

And Phillips Petroleum Company for many years has been one of the country's largest suppliers of aviation fuels for commercial, military, and private planes.

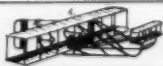
You can count on Phillips for quality—and dependable high performing aviation products for all ranges of flight.

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50TH ANNIVERSARY OF THE AIRPLANE



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Orville Wright
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